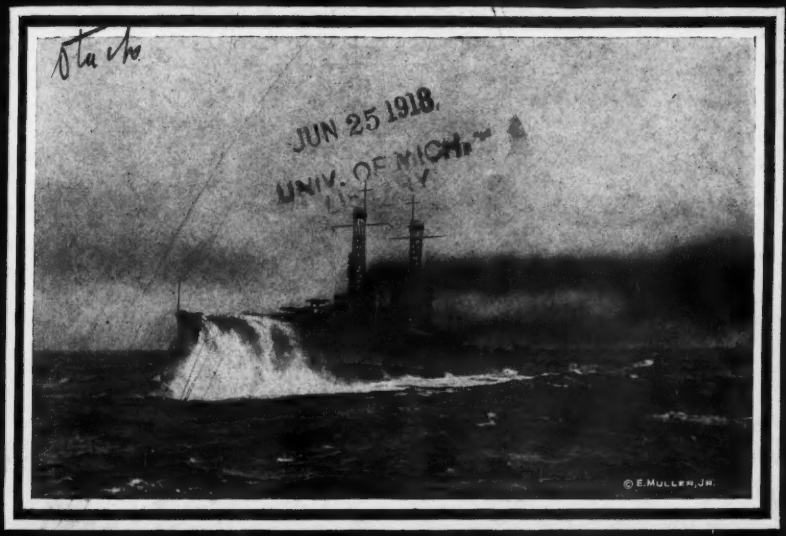
THE DENTAL DIGEST



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THE
DENTAL DIGEST

Vol. XXIV JUNE, 1918 No. 6

CONSERVATION OF PLATINUM IN DENTISTRY*

THE CONSTITUTION, PHYSICAL PROPERTIES AND PRACTICAL APPLICATION OF GOLD ALLOY REPLACING PLATINUM AND IRIDIUM FOR DENTAL PURPOSES, WITH THE OBJECT OF CONSERVING PLATINUM METALS FOR THE BENEFIT OF THE GOVERNMENT

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(*Continued from May*)

BINARY ALLOYS OF GOLD AND METALS IN GROUP I

It is a well-known fact that pure gold has but a limited use in the construction of various dental appliances, and that it is necessary to alloy it with various other metals in order to increase its durability, hardness, tenacity, and to vary the melting point above or below that of pure gold, as may be required. The metals in common use for this purpose have been copper, silver, and platinum, the latter to a limited extent; also zinc, cadmium, etc., for solders, which, of course, require a considerably lower melting point than the gold upon which they are to be used.

A thorough knowledge of the properties of the simple binary alloys is of paramount importance, because these properties almost invariably give an indication of what may be expected from more complex alloys.

It is generally accepted by metallurgists that binary alloys of gold and silver, copper, platinum or palladium form solid solutions. That is, solutions of one metal in another, if in proportion within certain limits. Such binary alloys as will be discussed, form solid homogeneous solutions except when otherwise noted.

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*Read before the Michigan State Dental Society, at its annual meeting in Detroit, on April 9, 1918.

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THE MELTING POINTS* AND DENSITIES OF METALS.

	Name of Metal	Symbol	M.P.°F	M.P.°C	Density
	GOLD	Au	1945	1063	19.3
GROUP I	Silver	Ag	1761	960	10.5
	Copper	Cu	1981	1083	8.9
	Platinum	Pt	3190	1755	21.5
	Palladium	Pd	2820	1550	11.4
GROUP II	Iridium	Ir	4170	2300	22.5
	Osmium	Os	4900	2700	22.5
	Rhodium	Rh	3525	1940	12.1
GROUP III	Zinc	Zn	787	420	7.1
	Cadmium	Cd	610	321	8.6
	Tin	Sn	450	232	7.3
	Aluminum	Al	1218	658	2.7
GROUP IV	Nickel	Ni	2646	1452	8.9
	Cobalt	Co	2714	1490	8.7
	Manganese	Mn	2237	1225	7.4
	Chromium	Cr	2750	1510	6.9
	Tantalum	Ta	5100	2850	14.5
	Tungsten	W	5430	3000	18.7
	Molybdenum	Mo	4500	2500	8.6
	Vanadium	V	3150	1730	6.1
	Titanium	Ti	3450	1900	4.5

*From Circular No. 35, U. S. Bureau of Standards.

The elements following Gold have been divided into four groups. This division is an arbitrary one, made for the purpose of facilitating references.

It is therefore unnecessary to enter into an academic discussion of the possible molecular affinity existing among various elements or of eutectics formed between the metals in the binary alloys that will be considered, because such compounds or mixtures do not occur in such alloys as may be considered *fit for use in the mouth.* For example, alloys of gold and copper in the proportion of 82 per cent. gold to 18 per cent. copper (by weight) form a eutectic, which is the lowest fusing of the gold-copper series, and when more than 18 per cent. copper is present the copper is not in uniform solution and segregates. As the alloys containing over 15 per cent. copper are extremely brittle and lack uniformity, no binary alloys containing more than 10 to 12 per cent. copper will be considered. In other words, alloys of gold and copper, when copper does not exceed 12 or 13 per cent. do not form any compounds with special characteristics.

To simplify the reference to ternary, quaternary, or more complex combinations of metals, alloys of only two metals will be termed, as is customary, "binary," but the alloys composed of three or more metals will be termed "complex" alloys.

ALLOYS OF GOLD AND SILVER

Silver is commonly utilized as an alloying element with gold. It is used, to a considerable extent, as part of the alloy in dental golds, and, as will be shown later, principally as a cheapening agent.

There seems to prevail generally an erroneous conception regarding the properties of silver-gold alloys. It has been stated* that silver is used to harden and to lower the melting point of gold. This deduction is distinctly contrary to the results obtained by the author. After making a number of binary alloys, it was proven that even the maximum percentage that may be used in dental work, say 25 per cent. of silver to 75 per cent. gold, does not confer any perceptible hardness upon the gold, neither does it lower the melting point to such an extent that the difference could be measured with a pyrometer.

Practically the only effect silver (even if present to the extent of 25 per cent.) has upon gold is to discolor the gold, making it greenish, and lower the specific gravity, thus increasing the volume. It will thus be seen that silver confers no special benefit upon gold, except cheapening it and acting as a color modifying agent. On the other hand, it may prove detrimental, as a considerable proportion of silver may *interfere with the action of other alloying elements when attempting* to produce a complex gold alloy, and also on account of the strong affinity that oxygen and other gases possess for silver. It will thus be readily seen that small percentages may be used to advantage as a color modifying agent, but a large percentage of silver is distinctly contraindicated.

Silver, in such proportions as may be needed for dental golds, alloys uniformly and without difficulty and may be depended upon to remain in uniform distribution.

The author has found that gold alloys, with a high percentage of

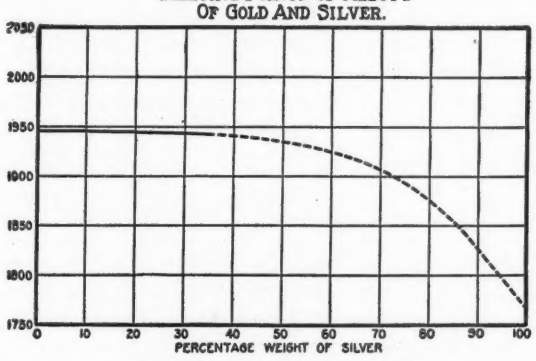


FIGURE 1

*Essig's Metallurgy, p. 163. Hodgen's Metallurgy, p. 278.

silver, when remelted and cast, show in the casting a considerable variation of the silver content which indicates that a partial separation takes place. This has not been investigated further for the reason that castings of gold with a high percentage of silver have no practical application. As stated before, small percentages of silver have practically no effect upon the gold, and this fact has been taken advantage of for a considerable period of time by at least one manufacturer who alloys pure gold with from one to two per cent. of silver and sells it as 24k. This alloy appears so similar to pure gold that the ordinary eye is deceived and the unprincipled manufacturer is the gainer.

Fig. 1 illustrates the melting point curve of gold-silver alloys.

Practically the same determination appears in very recent works on metallurgy.*

Silver-platinum alloys have been used to a considerable extent for crown posts, dowels, backings, etc. As a rule, alloys of this character (20 to 30 per cent.) are extremely unsatisfactory, both during their manipulation and in ultimate service, and their use should be avoided. They are somewhat improved with higher percentages of platinum, but the alloys are extremely ununiform and still quite soluble in acids and apt to discolor and corrode. The cost with more platinum is considerably higher, and even then the alloys are not equal to a fair grade of alloyed gold, either in usefulness or economy.

ALLOYS OF GOLD AND COPPER

Copper is one of the most commonly used and most useful alloying elements. It confers hardness and elasticity upon gold, but is detrimental when used in large proportions on account of its great tendency to *lower the melting point of the alloy* and the strong oxidation and brittleness of the alloys when the copper is in high proportion. It is, however, a most useful, and, in fact, an *indispensable alloying element* if employed judiciously. Alloys of gold and copper, such as U. S. coin gold (Au. 90 Cu. 10), have been used with most satisfactory results, both from the standpoint of durability and resistance against action of the oral fluids, and an alloy of this character is ideal for crown work, except for the disadvantage of its low melting point, which is caused by the copper content, and its range of usefulness is therefore limited even in the hands of the skilled operator. This inadequacy, as will be shown later, can be corrected by substituting platinum, etc., for some of the copper, thus raising the melting point and reducing oxidation without changing the

*Fenchel's Metallurgy.

valuable properties the coin gold possesses, namely, strength and durability.

Fig. 2 illustrates the melting point curve of gold-copper alloys.

As will be seen from the chart, the melting point of pure gold drops rapidly upon the addition of copper; 5 per cent. copper lowers the melting point about 100 degs. F., 10 per cent. copper lowers the melting point of gold about 200 degs. F., 15 per cent. copper lowers the melting point about 250 degs. F., and 18 per cent. causes a drop in melting point of about 300 degs. F. As will be seen from the illustration, the lowest melting point between gold and copper is when 18 per cent. cu. is present. The addition of more than 18 per cent. cu. causes a rise in melting point until the melting point of copper, 1980 degs. F., is reached.

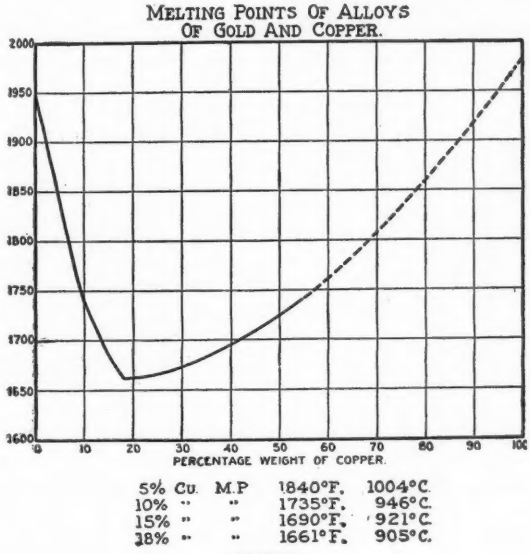


FIGURE 2

As mentioned previously, it is advisable to limit the total copper content to 10 or 12 per cent. Consequently, if the melting point of an alloy of gold and copper of requisite strength and hardness is too low, it is necessary to use platinum or palladium to bring it to the point desired.

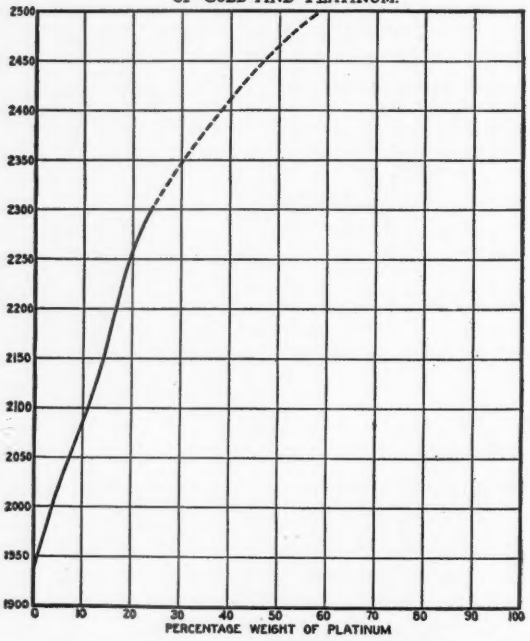
The valuable properties of copper as a hardening agent have apparently been underestimated by the authors of text books on dental metallurgy and other writers, but taken advantage of by manufacturers, as will be noted in the composition of commercial clasp metals described later.

ALLOYS OF GOLD AND PLATINUM

Platinum is being used to some extent as an alloying element with gold principally for clasp metal, etc., and to a great extent in gold alloys to be cast. It has been stated that platinum confers great elasticity and hardness upon gold, which appears correct, only to a limited extent. The author's experiments have indicated that platinum has *comparatively little effect as a hardening agent upon gold.* It does, however, raise the melting point considerably, as will be shown later.

Platinum is much inferior to copper as a hardening agent. This is readily proven upon an examination of a binary alloy of gold and copper containing 10 per cent. copper and a binary alloy of gold and platinum containing 25 per cent. platinum (so called platinum solder). A comparison of two pieces of equal dimensions will show that the gold-copper alloy, with 10 per cent. copper, is quite as hard and rigid as the gold alloy with 25 per cent. platinum, and more uniform. It is therefore evident that

MELTING POINTS OF ALLOYS OF GOLD AND PLATINUM.



5% Pt.	M.P.	2015°F.	1102°C.
10% "	"	2085°F.	1141°C.
15% "	"	2165°F.	1165°C.
20% "	"	2260°F.	1228°C.

FIGURE 3

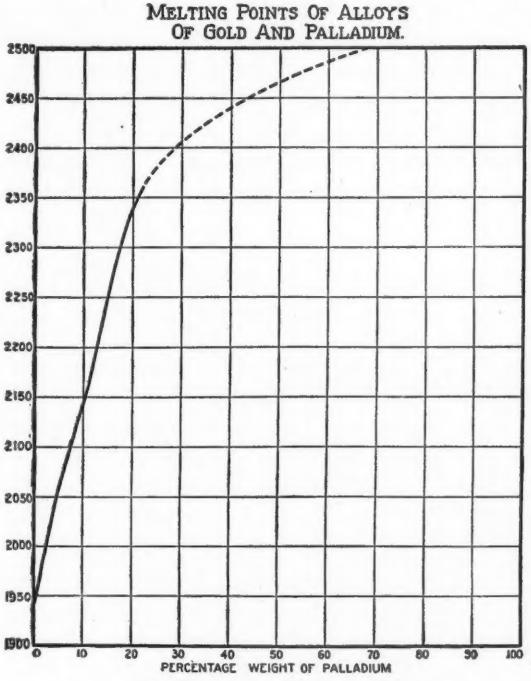
platinum is *not the most suitable hardening agent* and its range of usefulness as an alloying element is therefore limited.

Platinum, however, is an excellent adjunct to copper, as it tends to raise the melting point, which is lowered sensibly by any considerable percentage of copper.

Large percentages of platinum cannot be alloyed uniformly with gold, and in order to insure a uniform alloy it is not advisable to use more than 5-10 per cent. in a binary alloy and 10-15 per cent. in a complex alloy. In the latter the other alloying elements help to hold the platinum in uniform distribution. If it is desired to raise the melting point of an Au.-Cu. alloy higher than 10-15 per cent. platinum makes possible, it is advisable to use palladium, which combines perfectly in both the binary and complex alloys that will be considered.

ALLOYS OF GOLD AND PALLADIUM

Palladium is as yet a comparatively rare metal. It has been used to



5% Pd.	M.P	2060°F.	1127°C.
10% "	"	2145°F.	1174°C.
15% "	"	2250°F.	1232°C
20% "	"	2340°F.	1282°C

FIGURE 4

some extent in the industries and arts, but practically to no extent in dental golds. Palladium is a metal very similar to platinum except for its specific gravity, 11.4, which is considerably lower than platinum and its melting point, which is also considerably lower than that of platinum.

It has been stated that palladium makes gold brittle. This is contrary to the author's findings. More than twenty-five different alloys were made containing from 1 to 60 per cent. palladium. All of them appeared perfectly uniform and remarkably malleable, ductile, and tenacious.

Palladium also forms excellent uniform alloys with copper, silver, etc., and it is a very valuable adjunct to platinum in complex gold alloys.

Its use, however, is limited on account of the fact that it exerts a strong decolorizing action upon gold, 3-5 per cent. turning gold sensibly lighter and 15 to 20 per cent. almost white (platinum color).

Fig. 4 illustrates the melting point curve of gold-palladium alloys.

Another remarkable and most valuable property that palladium possesses is the fact that, although the melting point, 2820 degs. F. (1550 degs. C.), is considerably lower than that of platinum, a given percentage of palladium (by weight) will increase the melting point of gold more than an equal amount of platinum, and in view of the fact that platinum in considerable percentages does not alloy uniformly with gold, it is well to use palladium, as it alloys uniformly with gold in all proportions. Therefore, in alloys where color is no object palladium may be employed with very satisfactory results.

BINARY ALLOYS OF GOLD AND METALS IN GROUP II

GOLD—IRIDIUM

Iridio-platinum is usually employed in place of pure platinum on account of its greater hardness and durability. When experimenting with the series of binary alloys previously discussed, it naturally occurred to the author that gold alloyed with iridio platinum instead of pure platinum would prove superior to gold alloyed with pure platinum. A number of alloys were attempted and the results obtained were found invariably inferior to alloys of gold and pure platinum. The unsatisfactory results should have been anticipated because it is well known that iridium will not alloy with gold uniformly, but segregates on account of its extremely high melting point and high specific gravity. It is quite certain that in attempting to make the alloy, the following occurred: When the iridio-platinum was brought into the gold the heat used was sufficient to melt the platinum and set free the particles of iridium which did not go into solution with the gold-platinum mixture, but suspended and then segre-

gated in the same way as if free iridium were added to gold without the presence of platinum.

The experimental alloys were made of pure gold and 15 per cent. iridio-platinum (20 per cent. Ir.) and compared with alloys made of pure gold and 15 per cent. pure platinum. On rolling both to equal gauge, polishing and etching, the gold-platinum was found quite uniform, whereas some sections of the gold-iridio-platinum alloy (?) were harder and higher fusing, while other sections were softer and lower fusing than the gold-platinum alloy. In addition, all the gold-platinum-iridium mixtures appeared streaky and ununiform, even to the naked eye, while the gold-platinum alloys appeared almost perfect, even under the microscope.

Numerous other experiments were made along these lines, and in spite of the fact that some have advocated the use of iridio-platinum instead of pure platinum in alloys, it is the author's conclusion that pure platinum is far superior to iridio-platinum as an alloying element with gold.

GOLD-OSMIUM

No attempts have been made to form alloys with osmium, as it is even higher fusing than iridium, and therefore none but poor results may be anticipated. The author expects, however, to experiment with osmium to determine if there is any possible benefit to be derived from it, as alloys with osmium are claimed to be superior to alloys with iridium.

GOLD-RHODIUM

Rhodium is a metal of the platinum group that will prove of considerable benefit if a sufficient quantity of it can be obtained at a moderate cost. It is quite similar to palladium. It also has a low specific gravity, 12.1, and is considerably higher fusing than platinum (according to U. S. Bureau of Standards).

The author has not experimented with it in the pure state, but procured a quantity of it in the form of platinum containing 10 per cent. rhodium. This platinum-rhodium alloy was used for a considerable time instead of pure platinum. The alloys were quite satisfactory, but the advantages over pure platinum as an alloying agent were so slight and the cost so high that it appeared advisable to discontinue its use at the time.

ALLOYS OF GOLD AND METALS IN GROUP III

The metals in this group, consisting of zinc, cadium, tin, and aluminum, are employed principally in the compounding of gold solders, which, because of the fact that they contain no platinum, will not be discussed

here. However, in view of the fact that zinc is utilized in some of the alloys formulated by the author, it might be well to state at this time that *zinc does not burn out*, as commonly alleged, but on the contrary remains comparatively *constant*, and serves both as a *hardening* and *deoxidizing* agent.

For further information regarding gold solders, formulated for use in connection with the series of alloys described herein, and methods of compounding the various formulae, refer to the author's contribution on metallurgy in Peeso's Crown & Bridge Work, or Prothero's Prosthetic Dentistry.

BINARY ALLOYS OF GOLD AND METALS IN GROUP IV

Some time after the introduction of the casting process, it became apparent that alloys other than those ordinarily obtainable would have to be made in order to insure satisfactory results. The ordinary plate golds obtainable when cast in small bulk were too soft and frail, and the sections had to be cast larger, and heavier than normal and were therefore objectionable.

A number of experiments were made in attempting to cast the various clasp metals and the results obtained were very unsatisfactory. At this time literature began to appear regarding industrial alloys, both ferrous and non-ferrous, with the so-called rare, or little known, metals, such as nickel, cobalt, manganese, tungsten, vanadium, etc., enumerated in the table of elements under group 4.

Some remarkable results were obtained in various industrial steels, brasses, and bronzes, and it was not unreasonable to expect that some of these rare metals could be utilized to advantage in the formation of gold alloys for casting purposes.

In view of the fact that there was no precedent to follow and no literature on the relation of these metals to gold obtainable, it can readily be understood that the author's attempts to alloy these rare metals with gold were more or less empirical, and the results obtained were no better than should have been anticipated. Meeting with such poor success, the author proceeded with the series of researches into both the binary and complex alloys of gold with the elements in groups one, two, and three, and the formulae developed will be given in the articles to follow.

Since then a number of experiments have been made by other investigators in attempting to utilize some of the rare metals, such as nickel, tungsten, molybdenum, titanium, etc., as substitutes for iridio-platinum. The results so far have not proven successful.

This non-success will not appear strange to those familiar with both the chemical and physical characteristics of the elements mentioned. Unless some radical method of handling these metals is evolved iridio-platinum will continue to retain the position it occupies. (See Plate No. 3 and "Elastic" Gold, as substitute for Ir.-Pt.)

The author has not by any means given up hope of the possible utilization of some of the "rare" elements in connection with alloys for casting. He has since conducted a further and more extensive series of experiments and expects to publish the findings shortly.

It might be well to make a statement at this time regarding gold-vanadium alloys. The author cannot condemn the use of vanadium (vanadium-copper) in gold too strongly. His experience with an alloy known as "Vanadium-gold" which has been extensively exploited has proven that it discolors very rapidly in the mouth, and that the alloy does serve well in other ways although some rather extravagant claims have been made for it. A number of practitioners who have used gold-vanadium alloys have had similar experiences. Further data regarding these alloys will be published later.

(*To be continued in the July number.*)

THE NEW LIGHT!

We men of earth have here the stuff
Of Paradise—we have enough!
We need no other stones to build
The stairs into the Unfulfilled—
No other ivory for the doors—
No other marble for the floors—
No other cedar for the beam
And dome of man's immortal dream.

Here on the paths of every day—
Here on the common human way
Is all the stuff the gods would take
To build a Heaven, to mould and make
New Edens. Ours the stuff sublime
To build Eternity in time!

FOCAL INFECTION AND PREVENTIVE DENTISTRY IN THE CHILD*

By Paul A. Barker, D.D.S., Denver, Colorado

Much attention has lately been given by physicians, dentists, and dental societies and by medical and dental magazines and even by the daily press to a phase of dentistry which heretofore seems to have escaped the notice of the two professions. I refer to the theory of Focal Infection, or the belief that the location in the human mouth of either fistulous or blind abscesses constantly discharging pus into the system is the cause of various disorders elsewhere in the body, such as stomatitis, arthritis, rheumatism, etc. But notwithstanding all this attention and these numerous worthy papers and discussions on this subject, very little, if any, mention is made in any of them to the child and his dental needs. What is the reason for this? Is the child not worthy of consideration and discussion? Are his dental needs and tooth problems so well understood that further discussion and consideration are useless? Evidently not, for the country is just awakening to the Oral Hygiene movement and the necessity of caring for the children's teeth. There remains then only one answer to the question, the majority of dentists do not care to work on children, and so they have not bothered to write about or discuss them, but have continued in the old beaten path of restorative dentistry, replacing missing teeth in the adult which might have been saved in the child.

We discuss learnedly in our dental meetings and we strive mightily in our offices to extirpate nerves without pain and fill root canals asceptically and completely, and then when the tooth returns to us with a large abscess we swear wrathfully, and proceed to treat and reduce the abscess if possible, and if impossible, to extract the tooth. And yet these same dentists who will work patiently for one, two or three hours on a nerve extirpation and root canal filling, when presented with the case of a nervous or frightened child sadly in need of dental attention will give it a hurried and superficial examination, possibly fill one or two permanent teeth when three or four temporary ones needed it also, extract one or two temporary teeth which might easily have been saved and do very little if any prophylactic work, dismissing the little patient and quieting the parents' conscience with the explanation that "they are his baby teeth and he will soon lose them." And then we wonder

*Read before Denver Dental Society, April 11, 1918.

at the appalling number of abscessed temporary teeth, and even more so at the increasing number of mal-occlusions, never connecting the two.

Is this a fair way to treat these little patients, who cannot speak for themselves and demand good work and conscientious effort? Do they not deserve as much care and consideration as their parents? It is no wonder that the laity regard the temporary teeth so lightly when we as a profession refuse to give them the painstaking care and attention they deserve, and proceed to quiet the mother's anxiety about "those black spots on Mary's teeth" with the foregoing explanation.

Present day dentistry might be compared to the task of the man who tried to empty the ocean with a tea cup, for every cupful taken out thousands will run in; so it is with dentistry, the more restorative and reparative work we do the more there is to be done, and the sooner we, as a profession, realize that the majority of our troubles start in the child and that in the child they must be overcome, the sooner Preventive Dentistry will come into its own.

If these foci of infection in the mouths of mature adults are recognized breeders of trouble and centres of disease, is it not reasonable to suppose that these same centres of infection located in the mouth of an immature child would have even worse effects? Out of ten cases of mentally deficient children recently treated at our Public School Clinic, six presented with from one to four fistulous abscesses, and of the six, four had enlarged or abscessed tonsils, and two were anemic and poorly nourished. In these cases I do not maintain that the abscessed teeth were the original cause of the infection, but they were without doubt a contributing cause, and their eradication has materially aided in the child's normal recovery.

Some will possibly maintain that a child's natural resistance is greater than that of an adult, that he is young, eats heartily and gets plenty of exercise, and consequently is less susceptible to the dangers of focal infection than the adult. This may be and probably is correct, but it must be borne in mind that the child is susceptible to a long series of childish diseases such as whooping cough, measles, scarlet fever, etc., to which the adult is practically immune, and it is during these periods of sickness when the resistance is lowered and the vitality undermined that the pus bacteria from abscessed teeth get in their work, and are liable to make recovery a slow and difficult task at the best, and at the worst may hasten the death of the little patient.

For the treatment of the abscessed temporary teeth I have as yet found nothing to take the place of equal parts of Tri-cresol and Formalin sealed into the cavity with quick-setting temporary cement or hot gutta percha, and renewed every forty-eight hours until all odor and pus have

disappeared; the root canals and pulp chamber should then be carefully cleaned out and pumped full of some good antiseptic canal dressing (a paste of zinc oxide powder, Aristol and Eugenol I find to be very efficient in these cases) and the filling placed; the best results will be obtained by using a red copper or white silver cement for the filling material.

A new treatment has lately been developed by Dr. Percy Howe of the Forsyth Dental Infirmary for the abscessed sixth year molars, and it will, I believe, materially change some of our present technique in root canal work and cavity preparation in these teeth. It is at present being tried out at our Public School Clinic, and has so far shown some excellent results. For this treatment two solutions are necessary; they should be kept in dark glass bottles with glass stoppers as they deteriorate easily, and a fresh mixture should be made every two months. Solution one consists of a saturated solution of Silver Nitrate in water, to which is added little by little strong ammonia; as this is added a dark brown precipitate is thrown down which is soluble in excess of ammonia, therefore continue adding the ammonia until solution is clear. Solution two consists of a twenty-five per cent. solution of Formalin in water. For the treatment of abscessed or putrescent molars the rubber dam is placed, the pulp chamber opened and a couple of drops of Sol. 1 followed by one of Sol. 2 placed directly on the putrescent pulp, allowed to remain a few seconds and then the excess liquid absorbed with a pledget of cotton and the process repeated; seal the cavity with cement or gutta percha, and at the next sitting you will in most cases find the odor gone and no pus present; in some cases it may be necessary to give the tooth three or four treatments before the pus is entirely gone, and it is advisable to give all cases two treatments before filling and then sterilize your canals in the same way. With this treatment properly carried out it is possible to completely sterilize a root canal to the apex, and at the same time fill the sometimes numerous apical foramina with a deposit of pure metallic silver which permanently seals the tooth.

But I have found that one of the best uses for this treatment is for the sterilization of partially or completely decayed dentine in deep seated cavities of the sixth year molars, which if removed would expose the pulp and necessitate pulp capping or devitalization, both of which procedures are to be avoided if possible. To sterilize this infected dentine the cavity is prepared in the usual way, being careful not to cut away too much of the decayed dentine from over the pulp; two drops of Sol. 1 followed by one of Sol. 2 are now placed directly on the brown decayed dentine, allowed to remain a few seconds, the excess liquid absorbed and the process repeated; the decayed dentine will now appear almost black, and if the tooth is removed, ground and examined, it will be

found that a very finely divided metallic silver has been deposited in all the infected dentinal tubules, but not in the healthy dentine as the solutions will not penetrate unaffected tissue; this completely sterilizes and seals this brown dentine, and you may proceed with your filling as indicated, leaving the natural covering over the pulp which will thereby be assured of a much younger life.

It has been conclusively proven by exhaustive tests in the Forsyth Laboratories that this decayed dentine is thus rendered absolutely sterile and that the filling may be placed without fear of further decay from this source. This, remember, applies only to those teeth in which the decay has not yet involved the pulp. Dr. Howe has demonstrated that it is impossible to sterilize a cavity with a burr, as he has obtained a good growth of the Morro-Tissier organisms (which he tells us are the constant flora of decay) from beneath perfectly sealed fillings which had been in place for six months, thus demonstrating that the decay bacteria remain alive in many cases even after the cavity has been correctly prepared and filled.

This method of sterilizing these sixth year molars is, I believe, one of the greatest contributions that has been made to the cause of Preventive Dentistry, as it will enable us to save hundreds of these most important teeth which otherwise would be devitalized, later become abscessed and eventually extracted.

But it should become the aim of every dentist not only to "do his bit" but to do his best toward lessening the number of these deep seated cavities and abscessed children's teeth, and to do this our road leads us always back to the young child and to Preventive Dentistry; we must start with his deciduous teeth, filling the small holes while they are yet small, polishing the rough enamel and teaching him Oral Hygiene, in order that his permanent teeth may erupt normally and in correct position. It has been my observation that out of some hundreds of temporary teeth extracted, those with the most perfectly absorbed roots were the ones with live healthy pulps; about seventy five per cent. of them which were or had been abscessed showed incomplete absorption of the roots, and incomplete root absorption in a large number of cases means mal-occlusion, just as does the too early extraction of the deciduous teeth.

And so we must face the fact that although the immediate extraction of the abscessed deciduous tooth may be a quick and easy way of eliminating the abscess, it by no means completes the case or relieves us of responsibility as does the extraction of the abscessed permanent tooth, for we may have inflicted upon that child in later life all the terrors of mal-occlusion and its accompanying evils of nasal constriction, mouth breath-

ing, adenoids, etc. We have then the choice of three courses: first, to leave the abscessed teeth in place untreated; second, to extract before the proper time; third, to treat and cure the abscess if possible. The first course should not be considered in any case, for it may mean sickness, infection and possible death to the child; the second should not be followed until forced to do so, for it may mean a constriction of the arch and consequent mal-occlusion; there remains then only the last course, which is the best of the three, to treat and cure the abscess if possible, and do our best to prevent mal-occlusion from unabsorbed roots by extraction at the proper time; but better than any of these three is the course that will prevent them all, and that course is called Preventive Dentistry.

And it is a consummation devoutly to be wished for that the Dental Profession will heed the cry of Oral Hygiene and Preventive Dentistry which is becoming so insistent throughout the land, and lend their aid to these great movements by preaching the former and practising the latter, so that the coming generations may not be deprived of their rightful heritage, sound, healthy and regular teeth. And if this paper shall be the means of awakening a greater interest in the child and cause the occasional consideration and discussion of his dental needs in the meetings of this society, its object will be accomplished and the cause of Preventive Dentistry advanced another rung upon the ladder of success.

A DANGEROUS OCCUPATION

"The most dangerous occupation in the world is that of being a baby," said Dr. Jacob Sobel, Chief of the Division of Baby Welfare, Department of Health, New York, in closing an address before the Yorkville Medical Society. "Few hazards can compare with it. Less chance to live a week than a man of ninety; less likely to live a year than a man of eighty; less probability of surviving his first year than an aviator making ascensions daily for a year has of being alive at the end of that period, do you wonder how precarious an existence is that of a baby, and how necessary it is to forge about him every possible effort for the conservation of his health and life?"

INSTANCES OF THE RELATION OF APICAL FOCI TO SYSTEMIC CONDITIONS

By Fred D. Miller, D.D.S.

PAPER NO. THREE

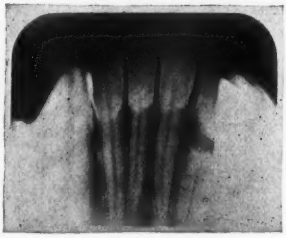
ACUTE ARTHRITIS DEFORMANS

Mrs. C., aged 38, had for a long time been a sufferer from an acute "inflammatory rheumatism." Though the family was only in comfortable circumstances she had been taken to California for the climate and to other places for mud baths, and had been given all the preparations which seemed to offer hopes of relief. Most of the family's resources had been spent in seeking to effect a cure.

When she first came to the office she was so feeble that she was brought to the door in a cab and had to be assisted to the chair. Her hands were seriously deformed, and her husband reported that her knee joints were greatly swollen. The pain in her back was so severe and constant that she bent forward as is customary with sufferers from this trouble.

By the advice of her physician her teeth had been X-rayed by an M. D. Roentgenologist. He advised that all her teeth be extracted.

A Wasserman test had been made and a negative report, and she had been given KI, and her former physician had recommended the removal of her tonsils, although this had not been done.



An examination of her mouth showed a very unclean condition with extensive calcareous deposits on all her teeth. The gums were considerably congested. The teeth were practically free from caries. It was decided that whether or not it was necessary to remove all her teeth, eight teeth known to be pulpless should be removed. At the first sitting

the deposits were removed, the teeth cleaned, and four lower left pulpless teeth on one side were removed and the sockets curetted.

Two weeks elapsed before the patient came again to the office. At this time she was so greatly improved that she walked from her home to the street car and from the car to the office. The four remaining pulpless teeth were extracted and the sockets curetted.

From the time of the completion of the extraction her condition has steadily improved, and she recently remarked to her physician: "Doctor, you and I will be able to dance together in a few weeks."

Of course the deformed joints will remain deformed but they will not become more so because the vegetative growth has stopped. The pain from which she suffered so constantly has entirely disappeared.

100,000 SMITHS IN THE ARMY

The army has more than 100,000 "Smiths," 1,500 William Smiths, 1,000 John Smiths, and 200 John A. Smiths. It has 15,000 Millers, 15,000 Wilsons, and 262 John J. O'Briens, of whom 50 have wives named Mary. There are 1,000 John Browns, 1,200 John Johnsons, and 1,040 George Millers.

These figures on identical names were cited by the Bureau of War Risk Insurance as a reason why applicants for Government soldiers' insurance, or for allotment and allowance payments should sign their full name, rather than initials only.

RECIPROCITY

By Alphonso Irwin, D.D.S., Camden, N. J.

STATES INTERCHANGE	MAY, BUT DO NOT INTERCHANGE	NO INTERCHANGE
Alaska	Connecticut	Arizona
Alabama	Montana	California
Arkansas	New Jersey	Colorado
Delaware	New York	Florida
Dist. of Columbia	Oklahoma	Georgia
Idaho	Pennsylvania	Mississippi
Illinois	Porto Rico	Nevada
Indiana	Utah	New Mexico
Iowa	Virginia	North Carolina
Kansas		Oregon
Kentucky		Rhode Island
Louisiana		South Carolina
Maryland		South Dakota
Massachusetts		Texas
Maine		Washington
Michigan		Wyoming
Minnesota		Hawaii
Missouri		Philippine Islands
Nebraska		
New Hampshire		
North Dakota		
Ohio		
Tennessee		
Vermont		
West Virginia		
Wisconsin		

Alabama interchanges with Illinois, Kentucky, Louisiana.

Arkansas interchanges with Illinois, Kansas, Missouri.

Connecticut may interchange, but none is reported.

Delaware may interchange, but none is reported.

District of Columbia interchanges with Indiana, Iowa, Kansas, Minnesota, Nebraska, Ohio, West Virginia.

Idaho exchanges with Utah only.

Illinois interchanges with Alabama, Arkansas, Indiana, Iowa, Kansas, Kentucky, Louisiana, Missouri, Michigan, Minnesota, Nebraska, Ohio, Wisconsin, and Vermont.

Indiana interchanges with Arkansas, Iowa, Illinois, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Missouri, Nebraska, Ohio, Oklahoma, Tennessee, Vermont, Wisconsin.

Iowa reciprocates with District of Columbia, Illinois, Indiana, Kansas, Minnesota, Missouri, Nebraska, Ohio, Oklahoma, Tennessee, Vermont, and Wisconsin.

Kansas interchanges with District of Columbia, Illinois, Indiana, Michigan, Minnesota, Nebraska, Ohio, Tennessee, Wisconsin.

Kentucky interchanges with Alabama, Illinois, Indiana, Kansas, Missouri, Tennessee, Vermont, or any state whose standing is equal to that of Kentucky.

Louisiana reciprocates with Alabama, Illinois, Mississippi, Ohio, Wisconsin.

Maine interchanges with Vermont, Maryland. "May interchange; no agreements; 10 years' continuous practice required."

Massachusetts. "May interchange; none reported; no agreements."

Michigan exchanges with Illinois, Indiana, Iowa, Kansas, Minnesota, Nebraska, New Jersey, Ohio, Pennsylvania, Wisconsin.

Minnesota interchanges with District of Columbia, Illinois, Indiana, Iowa, Kansas, Michigan, Nebraska, Ohio, Wisconsin.

Montana exchanges with Utah.

Nebraska reciprocates with District of Columbia, Iowa, Illinois, Indiana, Kansas, Minnesota, Michigan, Mississippi, Ohio, Tennessee, Oklahoma, Vermont.

New Hampshire. May interchange; no formal agreement is reported.

New Jersey cancels interchange. Law provides for it.

New York. No interchange; law permits it; six years' practice required.

North Dakota. May interchange with "those states having and maintaining the same standard." No interchange reported: fee $50.00.

Ohio interchanges with District of Columbia, Indiana, Iowa, Kansas, Louisiana, Michigan, Minnesota, Nebraska, Tennessee, Wisconsin.

Oklahoma. The law provides for reciprocity, but past interchanges are cancelled.

Pennsylvania interchanges with "no state."

Tennessee interchanges with Iowa, Kansas, Nebraska, Ohio.

Utah has no interchange at present; law permits it.

Vermont interchanges with Illinois, Indiana, Iowa, Kentucky, Maine, Missouri, Nebraska, New Hampshire.

West Virginia exchanges with the District of Columbia only.

Wisconsin interchanges with Illinois, Iowa, Kansas.

Alaska. May interchange; none reported.

Porto Rico. The law declares in Section 11: "The Board shall have power to make and establish all necessary rules and regulations for reciprocal recognition of certificates issued by other states." NO INTERCHANGE.

DOMINION OF CANADA

DOMINION OF CANADA DENTAL COUNCIL
W. D. Cowan, Sect'y-Treas., Regina, Saskatchewan.

Holders of a Dominion Dental Council license certificate can secure a registration license in Alberta, Manitoba, New Brunswick, Nova Scotia, Ontario, Saskatchewan, and Prince Edward Island, by paying the local registration fee. This is the nearest to Reciprocal relations apparently in Canada.

Alberta: Sect'y-Treas., James McPherson. Edmonton.

British Columbia: Registrar-Treas., Albert Brighouse, 307 Standard Bank Bldg., Vancouver.

Manitoba: Sect'y, Manley Bowles, Winnipeg.

New Brunswick: Registrar, F. A. Godsoe, St. John.

Nova Scotia: Sect'y-Reg., G. K. Thomson, Halifax.

Ontario: Sect'y, W. E. Wilmott, L.D.S., D.D.S., 96 College, Toronto.

Quebec: Sect'y, Endore Dubeau, Montreal.

Saskatchewan: Sect'y-Treas., L. J. D. Fasken, Regina.

Yukon: Sect'y, A. J. Gillis, Dawson.

Prince Edward Island: Sect'y, J. S. Bagnall, Charlottestown.

New Foundland: Sect'y, Dr. T. P. Smith, 203 Water St., St. John.

INFORMATION REGARDING EXAMINATIONS

Changes will be noted upon receipt of official notice to that effect.

Applicant for an interchange license must undergo the practical examination only. We herewith present a few typical examination requirements of Boards of Dental Examiners:

ILLINOIS

RULES AND REGULATIONS OF THE ILLINOIS STATE BOARD OF DENTAL EXAMINERS, RELATING TO THE EXAMINATION OF APPLICANTS FOR A LICENSE TO PRACTICE

PRELIMINARY REQUIREMENTS

The following preliminary qualifications shall be required of candi-

dates to entitle them to examination by this board for a license to practice dentistry in the State of Illinois: Graduates of reputable dental or medical school or college, or dental department of a reputable university, who enter the school or college as freshmen on or after the school year of 1906-7, must have a minimum preliminary education of not less than graduation from an accredited high school or a certificate from the State Superintendent of Public Instruction, equivalent officer or deputy, acting within his proper or legal jurisdiction, showing that the applicant had an education equal to that obtained in an accredited high school, which certificate shall be accepted in lieu of a high school diploma.

MANNER OF APPLICATION

Rule I. All persons desiring to commence the practice of dentistry in this State must apply to the Illinois State Board of Dental Examiners for a license.

Rule II. Applicants for the examination should present to the secretary of the board, at least five days before the commencement of the examination, a written application on a form furnished by the board, accompanied with a fee of twenty dollars; also additional fee of five dollars for the license and one dollar for registration certificate.

Rule III. The applicant must be twenty-one years of age, and furnish a certificate of moral character

EXAMINATIONS

Rule IV. The examinations shall be written or oral in the English language on the following subjects: Physiology, Oral Surgery, Pathology, Prosthetic Dentistry, Metallurgy, Orthodontia, Histology, Embryology, Anatomy, Materia Medica, Operative Dentistry, Therapeutics, Bacteriology, Chemistry, Anæsthesia, Oral Hygiene.

Rule V. *Practical Operative Dentistry.* Each candidate must furnish his own patient, also an engine, all instruments, and material. A chair will be provided. The board will select all cavities, and such cavities must be prepared in the presence of the board. At least one gold and one amalgam filling will be required. The board, at its discretion, may substitute an additional gold filling or gold inlay instead of an amalgam.

Rule VI. *Practical Prosthetic Dentistry.* Applicants will be required to furnish plaster casts for a full denture (both jaws) from impressions taken from the same mouth, together with the bite, mounted upon an anatomical articulator, and the work continued to the point of readiness for trial in the mouth.

The applicant will also be required to construct a gold crown in the presence of the board, and must furnish all instruments and materials.

The board, at its discretion, may change the requirements under Rule VI., substituting other pieces.

In view of the recent closer study and improvement in the management and arrangement of the occluding surfaces of artificial teeth, whereby the greatest masticating efficiency can be attained, the board deems it a duty to require of those who are to serve the people of the State a good working knowledge of the most approved methods of construction of artificial dentures.

To these ends and to approximate as nearly as possible the conditions that apply to practical prosthesis, the applicant is required to furnish plaster casts prepared by himself, for a full denture, both upper and lower, made from impressions taken from the same mouth. These to be mounted upon an anatomical articulator capable of registering the condyle paths in each individual case, the bite plates to be in position, and the work continued to the point of readiness for trial in the mouth.

The points or counts considered in grading are as follows:

First—Treatment of the impressions and casts to secure retention.

Second—Selection and general arrangement of the teeth. Occlusion.

Third—Contour or restoration of the features.

Special notice will be taken in the grading, as to the occluding surfaces of bicuspids and molars, whether they are of such form as will grasp, cut and crush food substances effectively; the balancing contacts when lateral and protrusive movements of the mandible are made; and the proportionate size of the teeth selected for the case in hand.

It is obvious that impressions and casts made from dummies or otherwise than from the natural mouth will not fulfil the grade requirements. The board will not give encouragement to half-hearted and perfunctory efforts on the supposition that nearly anything is good enough to pass the applicant.

Good equipment is necessary to attain correct results, hence an up-to-date articulator is an indispensable adjunct in the construction of up-to-date artificial dentures.

Crowns. The applicants will also be required to construct an articulated lower molar gold crown in the presence of the board.

The grading points are as follows:

First—Preparation of tooth.

Second—Adaptation of band to root.
Third—Occlusion. Form.
Fourth—Finish.

In order to secure something of uniform procedure, it is suggested that the applicant take an impression of his own natural teeth, make plaster cast, cut off a given tooth, adapt and insert an extracted tooth, and complete the case in accordance with the points designated in the grading.

It is further suggested that the applicant supply himself with a goodly number of extracted teeth from which to select a suitable one for his case.

Applicant must furnish all instruments and material for all practical work.

MINNESOTA

The Minnesota form illustrates the practical requirements in the northwestern section of the United States. It reads as follows:

Meetings—For examinations, are held at the Dental Department of the State University at Minneapolis.

Time—Regular sessions are held on the second Tuesday after the first Monday in March and November. A special meeting is usually held in June.

Requirements—Briefly stated the requirements of the Board for a license are:

Section A—If you have practised dentistry legally in any of the following states: District of Columbia, Indiana, Iowa, Kansas, Michigan, Nebraska, Ohio, Wisconsin for five (5) years or more, you will be obliged to furnish affidavits as follows: (1) From the Board of the State licensed in. (2) From two practising dentists of the State. (3) From two freeholders at your last residence in the State, certifying to the above facts and your moral character and professional attainments. Blanks will be furnished by the Board. Also you will be required to (4) prepare cavity and make one gold filling. (5) Prepare cavity and make one amalgam filling. (6) Prepare root and make one crown. (7) Prepare cavity and make gold inlay. A passing grade of 85 per cent. is required before license is issued. Fee $50.

Please note in above Section (A) that part of requirements pertaining to affidavits. An affidavit is a sworn statement, and must bear the official seal of a notary public or some other official who is qualified to affix the seal of the State in which affidavit is made.

The required affidavits must be in the hands of the secretary at the time examination begins.

Failure to provide yourself with the above mentioned affidavits before examination begins, will prohibit your taking the examination.

Section B—If you do not come under the head of Section A, then you will be obliged to (a) Present a diploma from a recognized college. (b) Take a written examination on following subjects: (1) Anatomy and Histology. (2) Physiology and Hygiene. (3) Chemistry and Metallurgy. (4) Operative Dentistry and Orthodontia. (5) Prosthetic Dentistry and Crown and Bridge Work. (6) Pathology and Bacteriology. (7) Oral Surgery and Anesthesia. (8) Materia Medica and Therapeutics. (c) Take a practical examination as follows: (1) Prepare cavity and make one gold filling. (2) Prepare cavity and make one amalgam filling. (3) Prepare root and make one crown. (4) Prepare cavity and make gold inlay. A passing grade of 75 per cent. is required. All patients are supplied by the Board. All material and instruments must be furnished by the applicant, except casting machines.

All applications should be in the hands of the Secretary at least ten days previous to examination. Fee $20.

NEW YORK

The practical examinations of New York may be quoted as typical requirements for the Middle States.

Practical examinations. Practical examinations in prosthetic and in operative dentistry shall be held the Saturday following the written examinations and at such other times as may be decided upon by the examiners in the districts in which they are held. All candidates for practical examinations shall be required to do the work during specified hours which shall be from 9 A. M. until 12 M. and from 1 to 4 P. M.

Practical examination in prosthetic dentistry. Each candidate shall bring: (1) a full upper and lower set of plain teeth to be mounted on an anatomical articulator, for rubber plates, to show proper occlusion; (2) a four-tooth piece of bridge work consisting of two abutment crowns, one of which shall be cuspid porcelain-faced Richmond crown, the other an all gold molar crown, and two porcelain-faced dummies, all with proper occlusal surface made to an articulation. The metal used shall be either gold, German silver or coin silver, and the solder for the first two shall be at least 18K. gold and for the last silver. For this examination the candidate must furnish himself with blow pipe, bellows, investing material and all other requisites to do the investing and soldering. All the work of mounting and soldering shall be performed before the examiner. The candidate and his teacher shall make affidavit that the crowns, the connecting bar, if used, and the abutments were made by the candidate. These shall be deposited with the examiner in prosthetic

dentistry to be returned, after two months, on application, at the expense of the candidate.

Practical examination in operative dentistry. Candidates shall bring patients—more than one (as cavities selected by them may not be accepted) and all material and instruments, except operating chair, necessary to insert a gold filling in an approximal cavity of a tooth with the adjoining tooth in position, and another in a cavity prepared for a gold inlay. After the cavity is fitted for the gold filling and inspected by the examiner the candidate shall fill the cavity with gold which shall also be examined. The candidate shall then prepare a cavity for a gold inlay. No cavity will be accepted with an enamel break of less than one millimeter in width.

Passing in the practical examinations. The candidate that obtains 75 per cent. or over in the practical examinations need not be reëxamined in these subjects except for cause.

Revocation of license. All charges against a practitioner of dentistry in this State for unprofessional or immoral conduct will mean a revocation of license.

MASSACHUSETTS

A meeting of the Massachusetts Board of Dental Examiners, for the examination of candidates, will be held in Boston, Mass.

Candidates who have applied for examination will report to the Secretary at Tufts Dental School, Huntington Avenue, prepared with patient, rubber-dam, gold, plastic filling materials and instruments, to demonstrate their skill in Operative Dentistry. The Board in every instance selects the cavity to be filled. Partially prepared cavities never accepted.

Candidates will appear with patient, necessary appliances and materials for taking an impression and bite, making a banded crown, a bridge, or a partial or full vulcanite plate.

The theoretic examination—written—will include operative dentistry, prosthetic dentistry, crown and bridge work, orthodontia, anatomy, histology, surgery, pathology, materia medica, therapeutics, physiology, bacteriology, anesthesia, chemistry, and metallurgy. This may be omitted under Reciprocity rules.

All applications, together with the fee of twenty dollars, if first examination, must be filed with the Secretary of the Board ten days before the date of examination, as no application will be received after that date.

Each candidate for a second or subsequent examination will be required to file a new application with the Secretary.

Every candidate for examination must be twenty-one years of age.

Application blanks may be obtained from the Secretary.

Applications must be made out in candidate's own handwriting.

Temporary licenses are never granted.

An applicant failing in his first examination will be entitled to one re-examination without charge; but for each subsequent examination a fee of ten dollars ($10.00) is required.

GEORGE H. PAYNE, D.D.S., *Secretary,*
29 Commonwealth Ave., Boston, Mass.

MISSOURI

Applications for examinations, accompanied by a fee of $10.00, credentials, including diploma, or a certified copy of their diploma, together with the college entrance requirements if the applicant has graduated within the past six years. (This does not apply to the members of the graduating classes of the colleges within the state. They being certified to by the college from which they graduate.)

Applications, together with the fee, must be in the hands of the Secretary of the Board at least ten days before beginning the examination. Applicants must also make affidavit as required on application blank.

Applicants must furnish all instruments necessary as well as material for all work. All must secure a license from the Board before beginning to practice. We do not issue temporary permits.

The Board meets at Jefferson City the second Mondays in June and October for examining applicants.

THEORETICAL EXAMINATION

All examinations must be written in the English language, on the following subjects:

Anatomy, Physiology, Oral Hygiene, Chemistry, Metallurgy, Histology, Bacteriology, Materia Medica and Therapeutics, Operative Dentistry, Prosthetic Dentistry, Oral Surgery, Orthondontia, Pathology and Crown and Bridge Work.

An average of 75 per cent. is required in the theoretical examination.

PRACTICAL EXAMINATION—PROSTHETIC, OPERATIVE

Prosthetic: Articulate and finish in wax a full upper and lower denture. Make a banded Richmond crown for one of the superior anterior teeth.

Applicants shall provide themselves with upper and lower models mounted on an anatomical articulator with the bite plates in position and select a set of teeth suitable for case. The wax shall represent the finished rubber plates ready for introduction into the mouth.

The applicant shall have models of his own mouth (no difference how irregular) mounted on an articulator, with suitable facings and extracted teeth (roots to be prepared in the presence of the members of the Board) ready to make a Richmond crown for any one of the six superior anterior teeth selected by members of the Board.

Operative: Applicants will be required to prepare cavities and put in a gold filling and an amalgam filling. The "Black Method" is recognized as our standard and the same is required. Patients for the operative work will be furnished by the Board at Jefferson City.

GRADING

Richmond crown. Preparation and adaptation of band to root, contact point and finished crown.

Artificial denture. Articulation, occlusion, arrangement of teeth, contour finished plate in wax and three point contact.

Fillings. Cavity preparation, finished fillings and contact point.

An average of 80 per cent. is required in the practical examination.

INTER-CHANGE OF LICENSE

Missouri has an interchange of license with the following states: Iowa, Illinois, Kentucky, Kansas, Nebraska, Arkansas, Indiana, Oklahoma and Vermont.

Applicants desiring to take the examination under this clause shall comply with the above requirements, except the fee which is $25.00.

Also a letter from the Secretary of the Board, in the state in which said applicant has been practising for the last five years just preceding, together with the seal of said Board, showing when applicant was registered in said state and that he has been in the legal and ethical practice of dentistry for five years or more.

It will also be beneficial to show that the applicant is a member in good standing of the state association in which he has been practising.

Applicants under this clause are required to take the practical examination only

V. R. McCUE, *Secretary*, Cameron, Mo.

VIRGINIA

1. *Name, Residence, Place and Date of Birth.*—Stating that the applicant is 21 years of age or over and a graduate of a reputable dental college or university.

2. *Preliminary Educational Requirements.*—The candidate must have a preliminary education, prior to his first year of dental study, equivalent to a high school course, embracing not less than 12 Carnegie units of study. Satisfactory evidence of this preliminary education must be presented to the Superintendent of Public Instruction of Virginia on blanks presented to the applicant by this Board. Candidates must present a sworn statement to the Board as to his or her preliminary academic education, dental education and a physical description of himself or herself. Must present a certificate from the president, dean or secretary of the dental institution of which the applicant is a graduate, showing the applicant's preliminary and dental education.

3. *Moral Requirements.*—Applicants must present a certificate of good moral character, signed by two dentists of good standing, not professors or teachers in any dental institution.

4. *Applications.*—Candidates must apply to the Secretary of the Board for blank applications, which are to be filled out as indicated. Applications must be returned to the Secretary ten days before the examination, accompanied by a postal money order or certified check for ten dollars, the regular examination fee. In case the applicant fails, the regular fee of ten dollars will be required at any subsequent examination. Each applicant will be required to bring with him or her to the place of examination, a cabinet size photograph of himself or herself of recent date, on the reverse side of which the candidate must write his or her name before a notary public, who must certify over his seal both to the identity of the photograph with the candidate and to the genuineness of the signature. No postal card, tin type or small photograph will be accepted.

5. Candidates will be required to obtain a general average of 75 per cent. upon a written examination on the following subjects: Anatomy, Histology, Physiology, Materia Medica, Pathology and Therapeutics, Chemistry, Operative Dentistry, Oral Surgery, Prosthetic Dentistry and Orthodontia, Metallurgy and Oral Hygiene, together with grades on practical work. Candidates falling below 75 per cent. on operative work will be counted as failed, although the general average may be more than 75 per cent. Omitted under Reciprocity rules.

6. *Requirements in Operative Work.*—Candidates will be required to operate in the presence of the Board or a Committee thereof. To

furnish his own instruments, engine and all material for operating; chairs being furnished by the Board.

7. *Requirements in Mechanical or Laboratory Work.*—The applicant must present an articulated model, bite in position, and set up and invest a full upper and lower denture thereon. Present an articulated model for a bridge. Must not be smaller than a six tooth bridge, including abutments. The abutments must be made and in position on the model. Dummies must be backed up and soldered and bridge polished and finished in the presence of the Board or a Committee thereof. He must furnish instruments and material, such as blow pipe, pliers, spatulas, etc., and investing material, plaster, solder, wax, etc., necessary for the due performance of his work.

Every candidate will be required to write and sign the following Pledge at the end of each examination paper: "I certify under honor, that I have neither given nor received assistance of any kind in writing this examination."

Address all communications for information as to examinations to the Secretary.

ALABAMA

A meeting of the Board of Dental Examiners of Alabama will be held at the Birmingham Dental College in Birmingham.

Theoretical Examinations will be on the following subjects: Operative Dentistry and Oral Surgery, Orthodontia, Anatomy, Physiology, Chemistry and Metallurgy, Prosthetic Dentistry, Materia Medica and Therapeutics, Oral Hygiene, Pathology and Etiology, Histology and Bacteriology, Anaesthesia; and answers must be written with black ink, in the English language, on paper to be furnished by the Board. Answers must be written in the order of the questions. Omitted under Reciprocity rules.

Do not copy the questions on your examination paper, but write number of each question in Roman numerals, in centre of paper just above the answer.

Practical examinations will be both Prosthetic and Operative. A bridge of four teeth, shell crown on first upper molar; Richmond or Morrison on cuspid, with two bicuspid dummies, one cast inlay. One gold, one amalgam and one silicate filling will be required.

Applicants will be required to furnish all necessary instruments and material for this work, including patient. The Board will furnish Operating chairs and Gas. No excuse will be accepted for failure to comply with these instructions.

Applicants will not be permitted to borrow or loan instruments or material during the progress of the practical examinations, or to give or receive advice either here or in the theoretical examination.

Tablet with question sheets must be returned to the examiner *intact*, with answers left in them and *no spoiled sheets shall be torn out* by the applicant, *but left in place with the answer sheets and marked void or spoiled, nor shall any other paper be used in the examining room for any purpose whatsoever.*

Each applicant will be furnished with an envelope containing a numbered card on which he will write his name, seal the envelope, and return to the examiners, and use this number on *every sheet* of examination paper. In no case shall the applicant's name appear on the paper.

Read the questions very carefully and do not give any information in the answer not asked for.

All applications and credentials should be in the Secretary's hand at least one week before the examinations begin.

The fee for the examinations, ($20.00) twenty dollars, must accompany application and in addition a certificate fee of ($5.00) five dollars will be charged for issuing certificates to successful applicants.

No fee will be returned to an applicant after he has filed his application and entered upon the examinations.

An applicant failing at the first examination may be reëxamined at "the next regular meeting of the Board," without an additional fee, provided he notifies the Secretary by letter at least one week before the examination.

Applicants will be assigned chairs by their numbers and shall use same chairs throughout the entire theoretical examination, unless changed by the examiner in charge.

Applicants must be at least twenty-one years of age and of good moral character.

A recent, *unmounted* photograph with proper indorsements, must accompany application and credentials.

H. CLAY HASSEL, *Secretary-Treasurer*,
Tuscaloosa, Alabama.

(*To be continued.*)

BOOK REVIEWS

ELEMENTARY AND DENTAL RADIOGRAPHY. By HOWARD RILEY RAPER, D.D.S., Professor of Roentgenology, Operative Technic, Materia Medica and Therapeutics at the Indiana Dental College, Indianapolis. Member of American Institute of Dental Teachers, local state and national societies, First District Dental Society of the State of New York, Western Roentgen Ray Society, Associate Fellow American Medical Association, Section of Stomatology.

The typography and binding of the book are excellent, and it has been adopted as a text book by the National Association of Dental Faculties.

Second Edition, 502 pages, with over 500 illustrations. Consolidated Dental Mfg. Co., Publishers, New York.

DENTAL AND ORAL RADIOGRAPHY. By JAMES DAVID MCCOY, D.D.S., Professor of Orthodontia and Radiography, College of Dentistry, University of Southern California, Los Angeles, California. Second Edition, enlarged and revised.

One hundred and seventy-five pages, with 123 illustrations. C. V. Mosby Company, Publishers, St. Louis.

DENTAL ELECTRO-THERAPEUTICS. By ERNEST STURRIDGE, L.D.S. (Eng.) D.D.S., Fellow of the Royal Society of Medicine, Member of the British Dental Society for the study of Orthodontics, Member of the American Dental Society of Europe, Contributor on Dental Electro-Therapeutics in the Science and Practice of Dental Surgery, on Ionic Medication in Prinz's "Dental Materia Medica and Therapeutics." Second Edition, thoroughly revised; 314 pages of text with 164 engravings. Price, $2.75. Lea & Febiger, Publishers, Philadelphia.

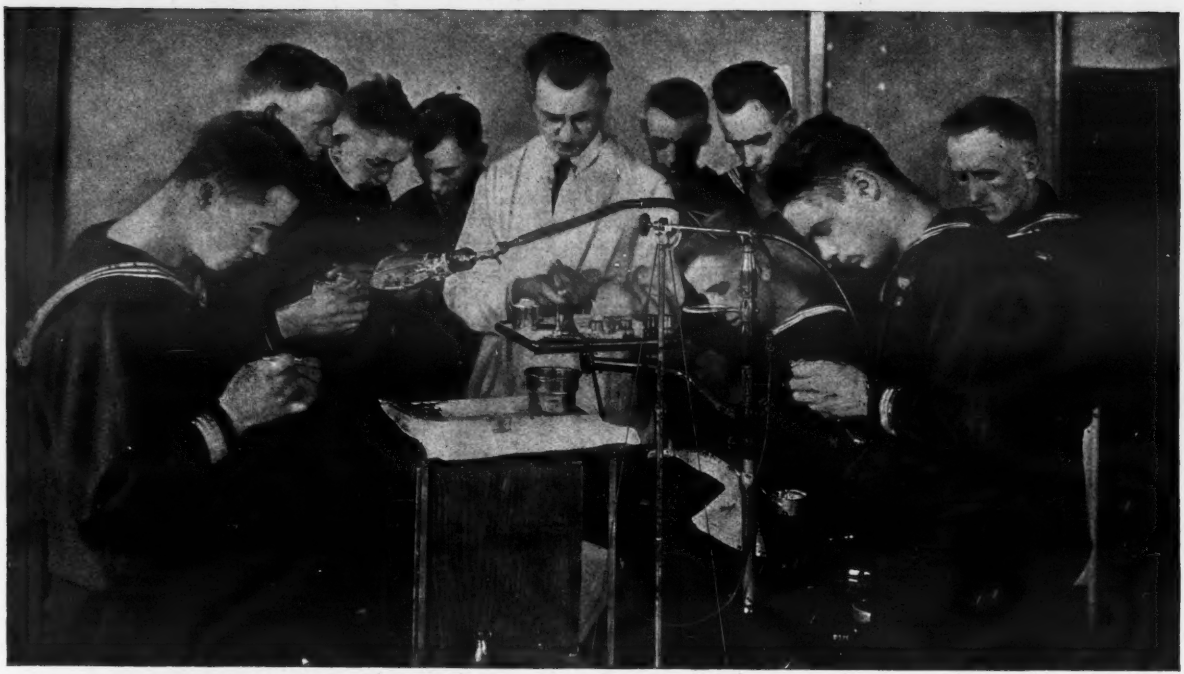
FIRST DENTAL COLLEGE TRAINING FOR UNITED STATES NAVY HOSPITAL CORPS

By Willard Connely, U. S. N. R. F.

Sailors are learning to extract and to fill teeth, to treat abscesses and pyorrhea, to make splints and to wire fractured jaws. They will be capable assistants both to naval surgeons and to naval dental surgeons. If a fellow bluejacket appears in the dispensary aboard ship, and displays an infected or broken tooth, the examining hospital apprentice will reach for the novocain and the universal forceps, he will apply them circumspectly, and if necessary, tannic acid or eugenol will be employed in the socket. In emergencies when a dental surgeon may not be present when a hospital corpsman would have to work independently and without supervision, that corpsman will set about his task confidently, because of well-balanced experience.

To the University of Minnesota Dental College has fallen the honor of being first in the field to train navy hospital apprentices in this humanitarian work. The results of such instruction will exert their peculiar efficacy, wherever these corpsmen are detailed to duty, toward conserving the fighting vigor of the enlisted personnel in our first line of defense.

This detachment of bluejacket students at the university, where they are trained also in medicine and nursing at the medical school, is a division of the U. S. Naval Training Schools in Minneapolis, of which the commandant is Commander Warren J. Terhune, U. S. N. Every four months one hundred hospital apprentices are examined for the rating of pharmacist's mate, then sent to sea or to coastal naval hospitals on the Atlantic. Dentistry has awakened in the men a sweeping curiosity and avidity to learn. In their research study of neglected molars the sailors have practically agreed that tooth roots are roots of all evil. At any rate, there will be no impacted wisdoms nor abnormal occlusion in their own mouths when these corpsmen depart to serve aboard ship.



To learn the uses and mixing of filling materials is to make the sailors avid to try their skill on civilian patients. Such advanced training is given them in the final stages of their course.

In mapping the course of dental training, Dean Alfred Owre has aimed to give the sailors a pretty good understanding of the rudiments, then to branch into those phases of first aid or temporary relief which the men could be depended upon to render with an assured modicum of skill. This instruction excellently supplements that given the hospital apprentices at the medical school, since one tends further to elucidate the other. The Dean has delegated the navy work to Drs. Hartzell, Griffith, Damon, Leonard, Brekhus, Walls, Holliday, Zierold, Cox, Godfrey, and several others; also, a number of senior students in the dental college have assisted. It can be seen at once that for a class of one hundred bluejackets enough preceptors have been provided to make sure that the corpsmen learn what they learn.

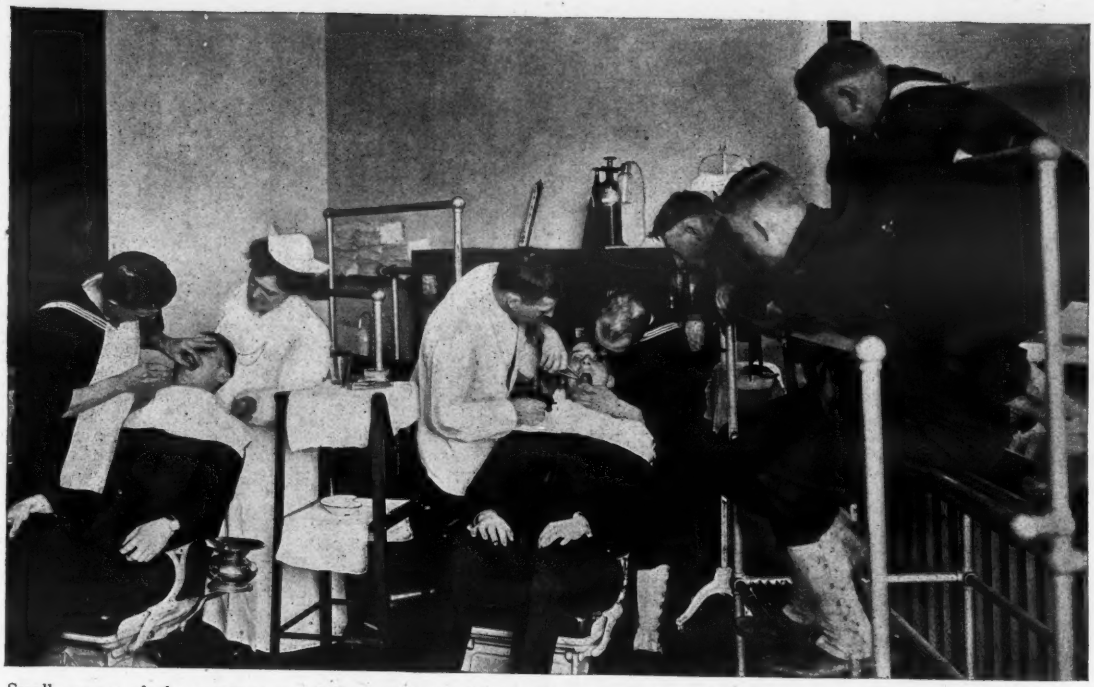
Perhaps an idea of the thoroughness and extent of the schooling in general can best be gleaned from an analysis of a typical navy course—dental anatomy, with its consequent prosthesis. In the first lectures, vivified by charts, ideal teeth and gums, and blackboard drawings, such primary definitions as tooth, tooth parts, crown, root, neck, pulp cavity and dental pulp are inculcated. Enamel, dentine, cementum and pulp tissue are of course described with especial detail, for on a comprehensive knowledge of these tissues rests much of the effectiveness of the sailors' later work in examining. It is required that classification of teeth be learned absolutely, those of simple or complex form, those of incising or grasping, crushing or grinding function, those of deciduous or permanent age. Then the arrangement of the permanent teeth, including establishment of the median line by passing an anterior posterior perpendicular plane through the mouth centre. Designation and annotation of a given tooth are taught, with the annotation system, because in working on civilian patients in the clinics the corpsmen are expected to be technically accurate in consulting instructors. In this connection the labial, mesial, distal, lingual and incisal tooth surfaces are delineated with repeated emphasis.

"Trying to remember so many new words," worried one of the hospital corpsmen, "is like trying to remember the names of a bunch of people you meet at a convention. I found myself picking up a tooth this morning and saying, 'Excuse me, but I forget your name'."

"I doped out a system," said another sailor. "Last week I bought a rhyming dictionary. I put words together like distal and pistol, incisor and surprise her."

Dentists will see immediately the significance of anatomical questions such as the following:

What differences do we find in the number and location of the roots of the various teeth?



Small groups of the corpsmen get daily practice in the extraction clinics. The sailor on the left is injecting novocain. The professor is instructing the other operating bluejacket in technique of handling the forceps.

In propounding such searching fundamental queries as this, Dental Anatomist Damon wakens the curiosity of the navy students to a pitch that demonstrates gratifying results. The reasons for bifurcation and trifurcation, and the common discovery of flexion, hold exploratory interest.

Then come definitions of apex, alveolar process, alveolus, peridental membrane, interproximate space, embrasures, contact point. The difference between occlusion and articulation, and the relation of the upper teeth to the lowers in normal occlusion, are stressed, in view of the prosthetics exercises to follow. Temporomandibular articulation, and the varied forms of movement we have in it, are pointed toward discussion of dislocation of the mandible.

"Yawning in lectures," one of the instructors severely remarked, "may cause just such a dislocation." Startled, every hospital apprentice for an instant sat bolt upright.

To learn the courses of the blood and nerve supplies to the teeth constitutes one of the two or three requirements of highest importance in the navy dental anatomy work. Here are given two not easy outlines to memorize. The first covers the divisions and branches of the internal maxillary artery; the maxillary, pteryoid, and spheno-maxillary, with lesser veins. The second outline, denoting the nerve supply, naturally analyzes the trigeminal nerve in its ophthalmic, superior maxillary and mandibular divisions. The final reference in this course embodies a study of all the foramina.

In the prosthetics laboratory, where the work is of course concurrent with the progress of the dental anatomy demonstrations, the sailors first take the modeling compound and make full upper and lower impressions of one another. Memories of molasses taffy predicaments are recalled. With these impressions plaster casts are made, whittled zealously, and are articulated in occlusion on wire. Then the jawbones are modelled in clay, in which the apprentices eagerly mount complete sets of teeth, with a mind to the correct dental arch and inclination. The remaining periods are given to cutting tooth sections, cross and longitudinal, to study the tissues, pulp cavities and root canals.

To oral hygiene is accorded fully as much time as to the foregoing study. Having just shown how much ground can be fairly well covered in four months, I shall not enter into too many particulars regarding the remaining courses But it is pertinent to state that the oral hygiene involves more personal individual concern on the part of the bluejackets than any other work on the schedule. No sooner does the hospital corpsman learn about gingivitis or ulcerative stomatitis than he rushes to a mirror. No sooner does he hear a talk on hygienic diet than he takes

After hearing a talk on gingivitis, abnormal occlusion and cleaning of teeth, half these men take chairs to have their calculus and stains removed by the others.

inventory of the navy ration. It is needless to say that his apprehension is entirely without reason, but he wants to satisfy himself. He is like the old man who knows it isn't going to rain, because the sky is cloudless, yet on his walk he takes an umbrella.

However, the basis of the value of education in oral hygiene rests in its doctrines of precaution and prevention. The navy men learn the causes of caries, gum inflammation, pyorrhea, and tooth movement. Next they learn intimately how each ailment is treated, how the teeth may be kept clean, why they must be kept clean, and the ultimate alternative—systemic disease following unhealthy mouth conditions. The use of the study of this last topic is invaluable to the men as an aid to diagnosis. Many and many a time aboard ship they will be called upon by the naval surgeon to suggest what malady may be afflicting a sick bluejacket. The slogan "Look to the teeth" is to be borne well in mind. As a method of reinforcing the principles of oral hygiene, the professor examines the mouth of every corpsman, in the presence of the others, and points out pathological conditions. After which the sailors are put to work cleaning the teeth of one another.

Practice in extraction is held to be a very essential preliminary to successful emergency dental work at sea. The last two months of the training period are spent largely in this department. Corpsmen finally become as familiar with handling the universal forceps as in plying a nutcracker, though with great deliberation, be it said. Clinical material at the dental college is abundant and diverse.

A popular mental picture, visualized by navy hospital apprentices as well as by other humans, is that the persuasion applied to an undesirable molar should resemble the pull in a tug-of-war. What if the roof of a patient's mouth came out with the tooth? Regrettable, but merely an example of poor roofing by nature. One of the professors set the men right on this point for all time.

"Now how would you pull the bung out of a cider barrel?" he asked. "Would you yank it, and let yourself fall over backwards, or would you work it easily and gently, from side to side?"

With the instruction in extracting there is the conjoined training in administration of novocain and nitrous oxide, and in post-extractive care with ferropyrine, tannic acid and adrenalin chloride packs. In the matter of pain control the bluejackets are shown how to spray novocain and iodoform into the socket, or to use eugenic acid, and instruction is given in removing bloodclot and in stimulating hemorrhage.

Frequent navy clinics are held in minor oral surgery. Such operations as would be likely to be performed at sea are observed by the men, some of whom are delegated each time to assist the attending surgeon. The

If these corpsmen were all hungrily plying nutpicks they could not be more intent on their work. In preparing cavities with hand instruments the apprentices enter upon their first laboratory instruction in operative dentistry.

Each pair of hospital apprentices begins in the prosthetics laboratory with this operation, which is a precursor to a series of increasingly useful and fascinating exercises.

wiring of fractured jaws and the making of gutta percha splints hold specific training benefits. Study of emergency positions for operation is another useful detail taught.

The course in operative dentistry might be considered a prolongation of the oral hygiene work. Preceding the actual chair duty is a series of lectures, main points of which are illustrated clearly by lantern slides. The histology of the teeth is taken up, with causes and effects of caries on dentine and pulp. The matters of incomplete enamel and fermentation are explained. Ensuing subjects are pathology of the pulp, infections of the periapical tissue, prognosis, and technique of repair.

In two large examining laboratories the sailors in two divisions of fifty members each then proceed to apply what they have heard discussed and seen demonstrated during the professor's classroom talks. Numerous instructors teach the men in methods of removing decay, by hand instruments and with the engine too. Working first with extracted teeth, careful training is given in the art of gaining access to the cavity, including precautions for sensibility and breaking down the enamel with chisels. Next a special period is devoted to retention form for temporary fillings, because the bluejackets will make chiefly fillings of that kind. While one division thus studies preparation of cavities the other is learning the uses of filling materials—cements and amalgam—temporary stopping and the treatment of infected teeth.

"Watch these men," says the Navy Hospital Corps Supplement, issued for the service by the Bureau of Medicine and Surgery. The statement commends this pioneer work of the U. S. Naval Training Schools in Minneapolis, referring to the medical and dental courses offered hospital apprentices at University of Minnesota. The Bureau expects these bluejackets to establish new high water marks for efficiency. The dental profession is invited to judge whether such expectations are warrantable. Will other great American colleges join in this worthy war achievement?

DIETETICS AND HEALTH

EXPERIENCES WITH DENTISTS

SECOND PAPER

The Cost of High Living

By Watson W. Eldridge, Jr., M.D., New York

When Dr. B. presented for examination he appeared to be the personification of health and prosperity. He is a tall man of large build, in good flesh, and except for a slightly bloodshot condition of the eyes had a pleasing complexion for a man 50 years of age. He is of ample girth, especially around what he jokingly calls "his equator." His clothes are of the best quality and fit only as a high class tailor can make them.

The symptoms of which he complained and which has caused his physician to refer him for an exhaustive diagnosis were dizziness, insomnia, loss of weight, and a headache which had begun some days before, which had increased in intensity, and which the family physician had been unable to relieve.

The first task of the diagnostician in such cases is to get as thorough a history of the case as possible, and also to form an intelligent opinion of the character and habits of the person with whom he has to deal. The personal equation often affects the conditions in the case and the manner in which the trouble can best be treated.

Dr. B. is a dentist, with a practice among the well-to-do people of New York City. For years he has reached his office at 8:30 each weekday morning and has worked hard and steadily until 4:30 or 5, with only time enough off at noon for a light lunch. He likes his work in a moderate degree, but it is by no means his entire vocation. The great bodily energy with which he is endowed and his naturally convivial habits lead him to take a great interest in men and things outside of his practice, to be active in dental society work and other societies, and to spend his evenings having what he calls "a good time." Inquiry showed that

what he called "a good time" always included something to eat and drink; that he took several big dinners each week, and with these dinners drank from one to three kinds of wine, sometimes with other drinks preceding or following. The results were that during the week he took an enormous quantity of food even for a man of his size, that he imbibed a good deal of alcohol, and that he took far too little physical exercise to balance the intake.

With such a history, it was at once evident that the dizziness, insomnia, loss of weight and headaches were most likely connected with the intake of excessive quantities of food, and with insufficient elimination. The physical examination showed that he had acquired a considerable degree of arterio-sclerosis, and that his blood pressure was 200 mg. or about 65 mg. above normal pressure for his age. A Wasserman test was negative, showing that no syphilitic taint had contributed to the arterio-sclerosis. It might naturally be expected that under such heavy and continuous attacks, the digestive tract would show great impairment, but in this individual case the resistance of the tract had been such that the impairment had taken other forms. The doctor had long suffered from a moderate constipation and had the habit of taking a laxative once or twice a week, but considering his habits both the constipation and his treatment of it were remarkably slight.

Further examination showed more serious indications. Probably as a result of the sclerosis, the "renal efficiency" was very low, something about half of normal. This indicated insufficient power of elimination on the part of the kidneys, and that the substances which the kidneys should have eliminated were being retained in the body. There was a distinct aortic murmur indicating that the sclerosis had materially reduced the elasticity of the aorta. Examination of the blood showed a marked retention of sugar and creatinine, and a urinalysis showed a pathological quantity of albumin in the urine. When the account was cast up, we thought that Dr. B, who looked to be in such excellent health, was in a pretty serious condition.

Treatment was immediately instituted but did not include medication. When the whole position was laid before the doctor and he saw that he stood at the breaking point of even his magnificent physique (?) and that he could hope to regain and retain health only by an immediate and complete change of his habits he consented to a regimen, which, in other days and without such pressing need, he would have hooted. He left his office for four months and went to a low altitude, to spare as much as possible his already overworked heart. He was given a list of simple, easily digested food, properly balanced to afford both nourishment and energy, and ate, drank and exercised moderately, living outdoors as much

as possible. It proved impracticable to take away all of his alcohol, but his daily allowance was greatly reduced.

At the end of four months the doctor returned greatly improved in physical condition. His blood pressure had fallen to 145 mg., a drop of 55 mg., the dizziness, headaches and insomnia had disappeared, and the loss of weight which had been progressive up to the time of his departure was arrested, though he had not taken on weight. The renal efficiency was much more nearly normal, favoring the elimination of waste products. The aortic murmur was nearly inaudible. He began his work again, working more moderately. He goes as much as ever among his friends in the evening, but follows a carefully ordered regimen of food, leaving on his plate that which he knows to be unsuitable either in quality or quantity. The blood pressure has risen slightly from the low point at his return, and it will probably be necessary for him to take frequent rest periods, but if he is persistent in a sane course he can probably live happily and work in moderation for many years.

The story of Dr. B. is of interest because he is a fairly typical representative of thousands of men in middle life who, endowed with good physical vitality and ambitious minds, persist in a food intake which is excessively unbalanced in quantity or character, and is further deranged by an intake of stimulants and who bring upon themselves serious physical ills which might easily be avoided by the institution of a proper diet before pathological conditions compel it.

The matter of proper foods and intelligent feeding can generally be settled for himself by any person in moderate health. When a person is ill, the matter becomes more technical and should pass into the hands of a specialist.

There is a general relation between the size of the body and the amount of food required, so that on the average more food is required to repair the waste and maintain the activities of the large body than of the small. By observation one can determine that when he eats about a certain amount he feels best, and that eating more or less affects him unfavorably. This amount, which produces the best feelings, should be regarded as the normal intake and all deductions should be based upon it.

Given the amount of food best for a body, attention should be turned to the character of food which will satisfy the two quite unlike requirements of nourishing the body and producing energy. While most foods contain elements of nourishment and energy production, there is usually more of one kind of material in a given article of food than of the other kind, so that it is customary to classify particular foods as nourishing when the materials for nourishment are dominant, and as energy pro-

ducing when energy producing elements are dominant. The foods classed as "nourishing" are the animal and vegetable proteins. The animal proteins in order of protein content, from greatest to least, include all flesh, eggs, fowl, milk and fish; the vegetable proteins, in order of richness of protein contents, from greatest to least, are beans, nuts, peas, turnips and tomatoes. The fats come under the head of proteins and play an important part in nourishing the body, in protecting it against cold and supporting many of the organs in position. The protein elements in food nourish the body and repair the losses caused by the discharge of energy, but they are not energy producers and any effort to supply energy by a diet of proteins is likely either to lead to overeating, and to the use of an excessively unbalanced ration. The animal proteins are more readily subject to putrefactive changes in the body than are vegetable proteins, and for this reason are less desirable for many people. In health, the animal proteins should form about one fifth of the diet for an average person, and the vegetable proteins about two fifths. While many people eat too much protein food, some do not eat enough to properly nourish the body.

The carbo-hydrates are the energy producing foods. In the order of their energy producing value, from highest to lowest, they are sugar, potatoes, cereals, corn, beans and parsnips. They undergo fermentative changes in the body and produce the energy by which the body functions. The carbo-hydrates are quite as important to the body as the proteins, and, in health, should form about two fifths of the diet for the average person. Just as energy cannot be maintained on a protein diet, so nourishment cannot be maintained on a carbo-hydrate diet. A judicious mixture of proteins and carbo-hydrates is therefore essential to what is called the balanced ration.

In connection with the carbo-hydrate elements of the diet, it is worth while to devote a moment's attention to the amount of carbo-hydrate food that is necessary for any given case. Much has been said about calories as a measure of food value. By the term "Calorie" is meant enough heat to raise 1 cubic centimeter of water one degree centigrade. The fermentation of carbo-hydrate food has been produced in laboratory experiments as nearly like the fermentation in the body as possible, and the heat given off has been measured in calories. This measurement is believed to represent fairly well the energy producing value of the food when fermenting in the body. So much has been said about calories that many people think a diet can be maintained by determining how many calories they need daily and then selecting food totaling that amount. This is a grievous error. The principle of caloric feeding cannot be used in that way, because it applies only to the carbo-hydrate

foods, which form, under normal conditions, about two fifths of the diet, but does not apply to the animal or vegetable proteins which should form about three fifths of the diet. The most logical way to determine a diet for any given person is to find out by experiment the total quantity of food required during the day to maintain the nourishment and activities of the body, and then to see that the carbo-hydrate elements of the food do not exceed the 2300 or 2400 calories which are about the average requirement for an average size person in 24 hours.

There are many important elements of food which are not fully understood. One of these which does not come under the head of either proteins or carbo-hydrates is so important as to deserve a word of attention. It is known that there exist, perhaps in minute quantities, in all cereals, vegetables and fruits certain substances not yet isolated but essential to the continuation of life and health which, for want of a better term, are known as "vitamines." Their presence and importance can be demonstrated as follows: If chickens are fed on wheat kernels without the bran, they will die of starvation. If the bran be analyzed into those chemical constituents which can now be recognized, and then those constituents be assembled in chemically pure form and in proper quantities, and fed to the chickens, the chickens will die of starvation. If, however, the chickens be fed upon the whole kernels, including the bran, they will thrive. Nature is so consummate a chemist that she has hidden something in the bran which our most exhaustive processes cannot detect and that something is essential to the continuation of health and life. The white flour which we had before the war is typical of food which, in the course of its preparation, has been robbed of its vitamines. It is therefore literally not a food of life but a food of death. This is true of many other refined forms of food. Yeast is rich in vitamines, so is lime water; so are the outer coverings of all the cereals. Extreme degrees of the absence of vitamines produce scurvy and rickets.

The gist of Dr. B's story is the story of thousands of men in professional and business life of whom he is an example, that the maintenance of health and strength is dependent upon an intelligent diet, and that if this intelligence is not exercised the very effort to maintain health may lead to an excessively unbalanced diet and the evils which unavoidably follow may threaten either the existence, the comfort, or the pleasure of the individual.

If errors of diet have crept in and their effects are visible they should not be treated by administration of laxatives, cathartics and the like, but by careful search for the source of the errors and by such correction of the habits of eating and living as the case requires. Nature seeks to maintain the body in health and supply it with energy to maintain its func-

tions, including elimination, with as little trouble to the individual as possible. Such trouble as comes is usually of our own causing.

125 WEST 58TH STREET.

GETTING A REPUTATION

As one of the results of this war a great chewing gum factory has been established in England, and it is said that the practice of jaw-gymnastics is slowly but surely making its way among the British public.

Which leads the New York *Medical Journal* to sum up the evidence for and against gum chewing. The most serious—perhaps the only—objection to it is aesthetic. From this point of view it is less vile than tobacco chewing only because it does not involve the disgusting expectoration. Chewing for purposes other than the preparation of food for digestion has been practised by man in all climes and ages and of all races, and of all the means of masticatory stimulation—tobacco, betel nut, the pacifier, a toothpick, a straw, or gum—the American gum is most harmless. It assists to a certain extent in cleaning the teeth after a meal; it promotes the flow of saliva, thus permitting this digestive secretion to reach the food which is often hastily swallowed in the quickly snatched meal that many persons indulge in, and it leads to no excesses and cannot be said to cause the formation of a habit.

Athletes say that chewing gum steadies and soothes them in the terrific nervous and muscular concentration of a game.

Therefore the *Medical Journal* can see no reason why this American custom should not be extended over the known globe.

GOING UP!

An American newspaper published the following telegram:

"News from Kansas that a boy climbed a corn-stalk to look around him and now the stalk is growing quicker than the boy can climb down. The boy is now out of sight. Two men have tried to cut down the stalk, but cannot do so because on account of the rapid growth they cannot hit twice in the same place. Much anxiety prevailed."

DENTAL ECONOMICS

STEPS TO VICTORY

Economy

War's consumption of goods is fixed by circumstances altogether beyond any individual's control. But an individual's capacity for producing goods, and at the same time an individual's needs, are not so fixed.

In adjusting our output of goods, it remains for us to adjust also our consumption, so that we may apply to war all that is needed. It is amazing how much we can accomplish, how far we can economize, and how much we can save if only we try. In Europe the nations have discovered in the potential and actual production, and in the thrift of the people, a means of meeting demands so vast that they were deemed three years ago absolutely beyond attainment.

We do not have to save on all necessities, except where those necessities are limited in supply and indispensable to winning the war. Luxuries are the things we can readily curtail. Former President Eliot of Harvard prepared a table early in the war showing the annual expense bill of the American people for things they put into their mouths that are not bread. The bill was $3,915,000,000. Liquor, tobacco, candy, soft drinks, tea, coffee, patent medicines and chewing gum made up this total.

There is vast room for private economy in the United States. We all like the good things of life, it is true, and many of us have been accustomed to buy so long as we could pay. But that process needs to be changed; because a man has money is no longer a reason that he should spend it.

Our paramount duty is to deny ourselves that others may live and that we may gain victory. In the United States 35 pounds of cotton per capita are now required to make the cotton goods we wear in a year. In 1870 we used 11 pounds per capita. Our per capita consumption of sugar lately was 89 pounds a year. A generation ago it was one half that amount. Economy that carries us back to the habits of our grandfathers will not hurt.

Of course, no one will dispute that a certain latitude must be permitted. We must be prepared for sacrifice. But sacrifice need not mean such a self-denial on the part of the American people as to be ruinous to business. Ill-advised and impetuous economy, meaning unemployment and closed factories, would be demoralizing. It is evident to every thinking man that business must be sustained, and the conversion of industry carefully brought about whereby the nation's energies are transferred from the satisfaction of personal wants to the satisfaction of the needs of the army and navy.

Sound business must be sustained if the nation is to be insured against economic instability. Furthermore, we ourselves must be sustained if we are to be kept efficient.

Pinching thrift that brings harm in its wake is to be avoided. If you do without certain necessary food your strength is impaired. If you do without warm clothing you pay a doctor's bill. Five cents on a street car may save you five dollars or five hundred dollars. The health of body and mind gained by proper recreation may be worth a great deal more than the money saved on the theatre ticket or automobile.

Sacrifice by any of us that means self-punishment would be ruinous in the long run; a starved mind or body, though it brought peace of soul, would not go far in contributing to win the war.

The kind of thrift that makes for serious depression in business activity and for personal inefficiency is wrong. Our supreme duty lies in keeping our affairs, our bodies and our minds vigorous and wholesome. If we are to have a long drain of war, and are to emerge triumphant, our country requires of us commercial and financial strength, and moral and physical strength as well.

So, then, we can afford no negative economy on the part of the American people. What we can afford is a curtailment of all unnecessary spending, and a wise and wasteless use of our resources. Waste is an economic offense; it is designed to have ill effect on the nation, and mischievous effect on the character of the waster.—*The Mechanics and Metals National Bank of the City of New York.*

And what is so rare as a day in June?
Then, if ever, come perfect days;
Then Heaven tries the earth if it be in tune,
And over it softly her sunlight plays.

—LOWELL.

PRACTICAL HINTS

This department is in charge of Dr. V. C. Smedley, 604 California Bldg., Denver, Colo. To avoid unnecessary delay, Hints, Questions, and Answers should be sent direct to him.

REMOVING PIN FROM POST CROWN.—In order to remove a pin from a detached post crown, where the pin may be broken, and you wish to use the same crown: Put the crown in dilute sulphuric acid over night, and the pin will easily be removed and the crown uninjured.—C. E. H.

A GOOD SUGGESTION.—To keep from burning a patient's lips, or spilling medicine on his clothes, and avoid the easiest damage suit possible: Fill the medicine bottle one third or one half full of absorbent cotton; add enough of the medicine to saturate the cotton in the bottle; you may then saturate the pellet of cotton by touching it to the cotton in bottle and your pliers will be clean and free from the drug. I have been using this method 20 years. I know of no better way to use carbolic acid, creosote, clove oil or any of those escharotic agents.—A. E. WALTERS, Texarkana, Texas.

Reply to H. J. C. My guess is that the "serum-like fluid" is saliva which leaks into the tooth through an unsuspected approximal cavity or perhaps under a leaky filling.—D. W. BARKER, Brooklyn, N. Y.

Reply to F. B. J. Put $\frac{1}{4}$ oz. of the alloy in a small bottle and immerse in boiling water for ten or fifteen minutes. The alloy probably contains a high percentage of silver. Such alloys should be always mortar mixed for at least three minutes to insure thorough amalgamation.—D. W. BARKER, Brooklyn, N. Y.

ANNEAL A LINGUAL BAR.—In the construction of lingual bar cases for partial lower dentures where the bar is to be soldered to gold saddles, the bar should be thoroughly annealed after bending and final adjustment has been completed, otherwise the heating in soldering will cause the bar to spring, and the case will not go back to place properly on the cast, and failure will result in the mouth. This result will also obtain in vulcanite cases unless bar is annealed before final adjustment.—VICTOR H. FUQUA, in *Dental Review*.

BLEACHING TEETH.—One of the very best bleaching agents for discolored teeth is 25 per cent. pyrozone. The root should be filled, and a pellet of cotton saturated with the pyrozone should be placed in the cavity and sealed with cement. It may be left two or three days, and if a tooth can be bleached at all it will be bleached by this method. The pyrozone comes in sealed glass tubes. Care must be exercised in opening the tube. It should be chilled on ice and wrapped with a towel, letting the narrow end of the tube extend from the towel. This can then be snipped off with pliers, and the contents of the tube poured into a clean glass-stoppered bottle. A second application of the pyrozone may be necessary in deeply discolored teeth.—*The Dental Review.*

Editor DENTAL DIGEST:

I had the most peculiar thing happen to me this morning, and I would like very much to know the cause, and to know whether any other dentist ever had such a case.

A young husky fellow about 20 years of age presented himself to have some teeth filled and a gold crown put on upper left lateral incisor. I had to extirpate the nerve of the upper lateral and cuspid. I had treated the nerves with arsenic and extirpated the one from cuspid, then from the lateral, and he assured me that there was no pain felt at all. I had the nerve from the lateral on the broach and we were talking about it and he remarked that he was so glad that it did not hurt him. Then all of a sudden he became violent and acted like a mad man, so some of my patients who were waiting in the reception room came in and helped me hold him. It lasted about five minutes, then he got quiet and said he had gone blind and could not see anything at all. But in about ten minutes more he got all right and said he did not remember anything that he had done, but said he had not felt the slightest pain during the operation. He said that he had never had such a thing happen to him before.

I did not use any kind of drug. I would like to know what caused him to have such a spell, for it is a very peculiar case to me.

B. F. WALTON, D.D.S.

Editor DENTAL DIGEST.

How can I remove AgNO stains from porcelain washbowl?

DR. R. W. VAN VALIN.

Probably some of our readers can answer this satisfactorily.

CORRESPONDENCE

Johnstown, Pa., Apr. 12, 1918.

Editor DENTAL DIGEST:

I enclose herewith copy of a letter received from a friend in service in France, and I think it will show to all dentists the real service that is being rendered the Government when we fill the teeth of recruits before going to camp.

Very respectfully,
D. L. YINGLING, D.D.S.

DEAR DOCTOR:

I often think of you all in the States. We are having some very good weather here. I have to look after a thousand men, sometimes more.

When you dentists fix up the men's teeth it is a big aid to us over here. The last men I got from the State of New York needed anywhere from one to six teeth to be filled and from one to four to be extracted, a very bad way for the men to be sent over, as supplies are scarce over here.

If you stay in America and do as you said, you will be as much good to the U. S. A. as if in the service. Life is rather hard on the field. We are just back from the front. I was there acting as Medical Officer and Dentist. It is a great place, not so bad. The rats and bugs are as bad as the Boches. So tell all the Dentists if they want to keep the men in the field to fill and correct their mouths before they come over. We have more men than we can handle and often a good tooth has to come out as we are not able to fill a tooth that has to be treated. So for the sake of the U. S. fill all teeth you can. Every tooth we pull out under shell fire is a big loss to the man, and if many come out inside of a year a man is not fit for the service. Will close. Hope to hear from you soon.

I remain, Yours truly,
LIEUT. GEO. L. CASSEL,
Somewhere in France.

BOSTON, April 30, 1918.

Editor DENTAL DIGEST:

On account of the extravagant statements in the newspapers regarding the seriousness of the fire which caused considerable damage to the building occupied by the Tufts College Dental School, I feel that a brief

statement of the actual situation in relation to this incident, if published in the DIGEST, would offset any wrong impressions entertained by the dental profession.

As a matter of fact, our chemical facilities have not been seriously crippled, and we are able to carry on uninterruptedly our work in all departments.

We have been in a measure repaid for our loss by the generous spirit shown by our sister school of Harvard University, through Dean Smith, and also by a kindly offer from President Merlin of Boston University, both extending to us the use of their buildings and facilities, should we require them. This broad attitude and genuine professional spirit I am very glad to acknowledge.

Very truly yours,
WILLIAM RICE, D.M.D., Dean.

May 4, 1918.

Editor of the DENTAL DIGEST:

It is surprising to think how sheepishly we sit back and enjoy the great and pleasing lectures and writings of our brilliant, capable, and willing brother practitioners on Oral Hygiene, Pyorrhea, and other pre-eminent subjects. Yet it is true. We do sit back, lazily and sheepishly, not heeding their call, letting suffering humanity go through life, marred and drawn, rheumatic and ruined, knowing within our own consciences that we could prevent, if only we would heed.

We sing praises to our great men, and we cannot praise them too loudly, but what are we doing as individuals? This is what I wish to ask.

There's not a man of us, and we call ourselves men, who cannot, if he wishes, obtain any amount of literature on any subject. We owe it to our profession to procure this literature and study it, but we owe it much more to the general public, and especially those under our care, to put the teachings into practice.

We have been taught to lash our patient with tongue lectures on oral hygiene, the care of the children's teeth, proper use of the brush and floss, in fact, everything we can think of that is good teaching for the ignorant public, but how many of us carry out our part of that teaching? It is easy to say: "You have pyorrhea." But it is provokingly hard to say: "You are cured." Then why not follow up the teaching of prevention, and when we have a person educated to taking care of his or her teeth, and visiting our office twice or more each year, do our part?

Just this week a young lady visited my office, who told me that she

was in the habit of going twice each year, and had been for several years, to a dentist and having her teeth looked after and cleaned. She complained of itching and bleeding gums. Upon examination I found that the labial, buccal, and lingual surfaces of her teeth were in comparatively good condition, but the proximal spaces were packed with a dark brown calculus, so dense and set that it seemed impossible to dislodge it with the small instruments it was necessary to use. This young lady unfortunately has pyorrhea. Whose fault is it?

After working about an hour and only partly getting over her teeth, she exclaimed: "Does it take all that to clean teeth?" I assured her it would take much more than that, and she said: "Why, Dr. —— only took about ten minutes to scrape and polish my teeth and he only charged a dollar." (I want to say right here that pumice stone has no place in the mouth where there are loose and bleeding gums and should not be used until all tartar has been scraped off and the gums given not less than two days to heal.)

I happened to know the man she mentioned, and he is a gentleman, ethical in the fullest sense of the word, toward his brother practitioner. This is not to cast a slur at any certain man but merely to call to the attention of the dental profession how neglectful we are as individuals.

How many cases of this kind could each of us recall? Taking dentistry as a whole, there's not a day passes that we don't leave something undone that we know to do for our patients. Then, what is the use of teaching the patient to visit the office twice each year if we don't follow the teachings that are given us?

I am ashamed to say the fault lies mostly with our hurry and greed for money. "O, you specimen of humanity! What will become of our profession and dependent people, if, as individuals, you let laziness and greed get the upper hand?"

Our consciences cannot be depended upon to guide us, for they are seared. We must be lashed and whipped into line by the men we look on as leaders in our profession. I think that we are in need of a great number of lectures, directed, in simple form, to the dentist as well as to the general public, and I will hail with joy any writer who will choose it as his task to keep us poor weaker ones strengthened by his ever willing and helpful advice, delivered in the forceful way that it will have to be.

Respectfully,

J. V. CHANDLER, D.D.S.

THE BEST OF CURRENT THOUGHT

(*Dental Cosmos*, May, 1918)

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Traumatic Cerebral Edema Causing Late Signs of Focal Cortical Irritation: Report of Case. By Gonzalo E. Espejo, M.D., New York.
Are All the Tubercle Bacilli Found in the Sputum Virulent? By H. J. Corper, M.D., Chicago.
Treatment of Diabetes from the General Practitioner's Standpoint. By N. W. Janney, M.D., New York.
End-Results in the Prostatectomized Patient: A Comparative Analysis, Based on One Hundred and Ten Cases (Fifty-Five Suprapubic, Fifty-Five Perineal). By Clarence Martin, M.D., St. Louis.
Globules of Metallic Mercury in the Tissues: Findings in an Aortic Aneurysm with Erosion of the Vertebrae. John A. Kolmer, M.D., and E. V. Mastin, M.D., Philadelphia.
Control of Polyuria in a Case of Diabetes Insipidus by Means of Hypothysial Extract. By Jacob Rosenbloom, M.D., Pittsburgh.
The Total Blood Volume in Pernicious Anemia. By Edward Lindeman, M.D., New York.

A SHORT ACCOUNT OF A YEAR'S WORK AT ONE OF THE JAW INJURIES CENTRES OF THE LONDON COMMAND

By G. Northcroft, L.D.S.

(*Conclusion*)

The first principle governing the treatment of jaw injuries of whatever type is oral hygiene. To attain this all septic teeth, roots, and other foci of infection should be removed as early as possible. This may sometimes prove a very difficult ideal to attain. For example, the removal of a root from a fragment itself so loose that one feels the part is a greater problem than the whole. There are exceptions to every rule, but time and again one has proved the efficiency of this treatment in the earlier response of the tissues to repair. One also recognizes that in extreme cases, when roots or crowns of teeth have been blown into the tongue or cheek, or a foreign body may be undetected in the soft parts, time only will reveal these sources of infection, but the preliminary surgical toilet of the mouth will only be slightly impaired by such an oversight and the general principle holds good. This preliminary treatment should be followed up by constant irrigation.

It seems unwise to lay down any hard and fast rules as to extractions near the site of fractures. One must necessarily be guided by circumstances. Even a septic tooth may have to be retained to form a *point d'appui* to rotate, evert, or invert a fragment which otherwise would have to be left to take its abnormal, possibly unfavorable, position of convenience. Remove such teeth at the earliest opportunity by all means, but do not ruin a result by too early radical treatment. The second step to all possible cleanliness is a correct assembly of all misplaced fragments, and experience again teaches that the nearer the fragments can be placed to normal contact, the quicker good results are obtained. It is a curious thing about jaw work that, whenever one tries to lay down a fundamental principle, it always seems to be upset by the next half-dozen cases one sees. A Canadian, a returned prisoner of war, was seen who had been successfully treated for a fracture of the mandible at the angle, still retaining a septic root which had actually given rise to an abscess and had not been removed. With indifferent dentures such as one so frequently sees in an English soldier, where grave comminution is present, accompanied by profuse suppuration and possible loss of substance, contact, even at the loss of ideal occlusion, produces quicker and more satisfactory results than ideal occlusion and the doubtful utility of bone-grafts. One has yet to see the successful bone-graft where an ideal

occlusion has been obtained. We feel, therefore, that it is largely a matter of degree of asymmetry or mal-occlusion, and the personal equation comes very largely into play. Touching the subject of comminution, I heartily endorse all that has ever been said since the first days of the War as to the danger of surgeons being too drastic in their treatment. It is a very grave responsibility for a surgeon to remove any pieces of bone that are attached by periosteum, however loose they may appear to be. One is confident that many such pieces form a bridge upon which new bone is built, or centres from which osteogenesis radiates. It is a regrettable fact that satisfactory treatment for the posterior edentulous fragment is still lacking; external transfixion of the ascending ramus has never been attempted with us, and all the cases with much loss of substance suitably treated by bone-graft have been cases of this type. In these cases, even where union is complete, much shortening frequently occurs from the upward and forward movement of the uncontrolled fragment and renders the management of a bolus of food on the injured side a practical impossibility when artificial teeth are inserted. The ideal union as demonstrated by sawing through a morbid specimen is seldom seen in gunshot wounds; only too often, contact is missed altogether.

Another point that experience has taught is the removal of cheek teeth in order to let the lips approximate when there has been much loss either of bone or soft parts in the region of the symphysis. Frequently in restoring the lower lip line the plastic operation involved lowers the lip line so much that this is the only method that can be adopted to bring the lips into contact. We would appeal to all plastic surgeons in consequence of this, and many similar operations, to make flaps big enough to avoid, as far as possible, this contraction of the buccal orifice.

In fractures of the mandible only, cemented cap splints have been largely used, the displaced fragments first having been reduced as nearly as possible to normal. The *attele* has not been used as much because of its greater tendency to become uncemented. Recourse has been had to immobilization only where the posterior fragment or fragments are edentulous. The method of reduction depends very largely on the condition of the individual patient, the time elapsing between the date of injury and the commencement of the treatment and the mobility of the fragments; and varies from the simple ligature of wire or grass line, the reconstruction of a model to normal and the forcing of the fragments into a splint so constructed, to the more elaborate methods founded on the principles developed in ordinary orthodontic practice. Simplification and cleanliness of apparatus are always the first aim.

In treatment of fractured maxilla, time is an even more important factor, the reduction of the underlying bone being more difficult, while the

soft tissues cicatrize very rapidly, often causing irreducible malformation of the palate. The antrum is very often involved, and the necessity of an intranasal operation is indicated where chronic suppuration of this sinus persists. The closure of small openings by operation is of doubtful utility, as no cases have yet been seen where a denture was not required, owing to the loss of teeth, before or at the time of injury, and this effectually closes any opening in the hard palate. In cases of greater loss surgical interference is out of the question, and one must resort to the usual restorations as practised for excision of the maxilla for malignant disease. No case of loss of the soft palate has yet occurred at this centre. A graduated series of vulcanite plates seems to fulfil the requirements of most cases, often accompanied by the use of chin and skull caps. Where the whole maxilla has been wrenched off its bony base, the Hamilton bandage and the upper Hayward splint have been used to advantage. This allows mobility of the lower jaw, and the calvarium is used as a *point d'appui*.

In fractures of both mandible and maxilla some form of double Gunning splint must be adopted, being necessarily removable. If there is no displacement in the upper jaw and the teeth only require to be steadied, the splint may consist of upper and lower metal caps soldered together. If there is gross displacement of the palate, or perforation, a vulcanite upper with a metal lower cap can be used with advantage. If the fracture is accompanied by extensive laceration of the soft parts an interdental extension has been found of great service in preventing subsequent closure from cicatricial contraction, and as an aid to feeding where the occlusion is nearly perfect. This should be accompanied by some form of chin support, such asthe aluminum chin cap and head net, which has been the method most favored for immobilization at this centre. A broad rubber elastic bandage has also been used, and a Hamilton bandage with chin piece.

One result has been fully demonstrated which can be obtained without bone-grafting. This result has come about in just one year. Another case has been shown of a patient wounded in August, 1914, who was operated on by Lindemann and Bruhn at Düsseldorf in March, 1915, and supplied with a tibial graft under local anæsthesia, the graft being fixed by ivory pegs. In this case the posterior fragment was edentulous and no external fixation was used. As far as one can gather union was not satisfactory at the medial end, for the patient having been interned in Switzerland on December 14, 1916, was operated on in February, 1917, for the excision of bone and hair from the anterior end of the graft. In May, 1917, Professor Matti inserted a graft from the crest of the ilium which he fully described for the profession. Four dentures have been con-

structed unsuccessfully already, and the man at present has only two right lower molars to chew with. Presumably, the failures were brought about by failing to recognize that the left cheek was paralyzed, and that a bolus of food could not be dealt with on that side. It is hoped that the new dentures will prove of greater service.—*British Journal of Dental Science.*

VALUE OF GOVERNMENT SECURITY

The Government can do what no private corporation can do—it can go out and compel people to pour in taxes enough to enable the Government to meet its obligations. North America would just about slide off into the sea before anything could happen to destroy the value of those bonds.

Buying bonds secured by our government is always a safe investment. It is a method of saving money that causes no doubt or anxiety concerning the result. Why should any one fail to plan the saving of a part of his earnings when such a sure and easy proposition is offered him? However, "easy come, easy go" is too much a feature of our American life, which seems to make the ordinary man's incapacity in normal times to lay by and hang on to money his last thought.

A big life insurance company gathered some facts about this not long ago. Here they are:

Take 100 healthy men at the age of 25 and follow them. At 65 here is where you will find them:

Thirty-six will be dead.

One will be very rich.

Four will be wealthy.

Five will be supporting themselves by work.

Fifty-four will be dependent upon friends, relatives or charity.

Or, to sum up, only five out of the sixty-four living will be "well fixed." The rest will either not have saved anything because of their extravagance, or they will have lost their capital through trying to make it yield an absurd return.

NATIONAL DENTAL ASSOCIATION

SPECIAL ANNOUNCEMENT OF HOTELS AND GARAGES

The National Dental Association will hold its Twenty-second Annual Meeting in Chicago, August 5–9, 1918. The headquarters will be at the Auditorium and Congress Hotels situated on Michigan Avenue, corner of Congress Street. All meetings, clinics and exhibits will be held in these two hotels, which are connected with an underground tunnel.

The important announcement at this time must be the warning: "*Reserve your rooms at once. Make reservations by mail direct to the hotel of your choice. Arrangements for parking cars should be made direct to the garage.*"

The following is a list of hotels and rates:

AUDITORIUM HOTEL, MICHIGAN BOULEVARD AND CONGRESS STREET

Single Room without bath, $1.50 and $2.00 per day.
Single Room with bath, $2.50 to $4.00 per day.
Double Room without bath, $2.50 and $3.00 per day.
Double Room with bath, $4.00, 5.00 and $6.00 per day.

CONGRESS HOTEL AND ANNEX, MICHIGAN AVENUE AND CONGRESS STREET

Room, detached bath (One Person), $2.00, $2.50, $3.00 per day.
Room, private bath (One Person), $3.00, $3.50, $4.00, $5.00, $6.00 per day.
Room, detached bath (Two Persons), $3.00, $4.00, $5.00 per day.
Room, private bath (Two Persons), $5.00, $6.00, $7.00 per day.
Suites: Two connecting rooms, private bath (Two Persons), $6.00 to $10.00 per day.
Three or four persons, $8.00 to $14.00 per day.
Corner Suites: Parlor bed room and private bath, $10.00 to $50.00 per day.

The following is a list of garages and rates:

Our rates for storage are $1.00 for the first 24 hours, and 75 cents each additional 24 hours. At these rates cars can be taken out for driving and reparked during the same 24 hour period at same charge.

CITY AUTO PARKING COMPANY,
A. V. Jackson, Gen. Mgr.,
Michigan Ave. and Lake Street, Chicago, Ill.

We are prepared to take care of thirty or forty cars during your convention, at a special rate of 75 cents per day, providing they notify us of their identity as a member of your Association.

DOWN TOWN GARAGE,
A. J. Bemmer, Mgr.,
Michigan Blvd. and Eighth St.

One thousand cars can be parked in Grant Park (on the Lake Front) free. The City of Chicago furnishes policemen to watch these cars.

J. P. Buckley, Chairman,
Publicity Committee.

FUTURE EVENTS

June 12–14, 1918.—The Semi-Centennial Meeting of the Georgia State Dental Society will be held in Atlanta, Ga. This Society will celebrate their 50th anniversary.

June 12-15, 1918.—The next examination of the Pennsylvania Board of Dental Examiners will be held in Philadelphia and Pittsburgh, on Wednesday, Thursday, Friday and Saturday. Application papers can be secured from the Department of Public Instruction, Harrisburg.

June 13-15, 1918.—Kentucky State Dental Society, Lexington, Ky.

June 13, 14 and 15, 1918.—The New York State Dental Society. The 50th anniversary of the Dental Society of the State of New York will be held at Saratoga Springs, New York. A cordial invitation is extended to all members of the National Dental Association.—A. P. BURKHART, 52 Genesee St., Auburn, N. Y., *Secretary.*

June 17, 1918.—The Wisconsin State Board of Dental Examiners will hold their Spring Examination at the Marquette College, 9th and Wells, Milwaukee, Wis. All applications must be in the Secretary's hands thirty days before examination.—F. A. TATE, Rice Lake, Wis., *Secretary,* Wis. State Dental Board.

June 17, 1918.—The Next Meeting of the North Carolina State Board of Dental Examiners will be held at Wrightsville Beach, Wilmington, N. C., beginning promptly at 9:00 o'clock on Monday morning. For further information and application blanks address DR. F. L. HUNT, *Secretary,* Asheville, N. C.

June 17–18–19, 1918.—The fifty-first annual meeting of the Tennessee State Dental Association will be held in Nashville, Tennessee.—GEO. L. POWERS, Paris, Tenn., *Secretary.*

June 17-22, 1918.—Next meeting of the Indiana State Board of Dental Examiners will be held at the State House, Indianapolis. Application and other information may be obtained by addressing H. C. MCKITTRICK, Indianapolis, Ind., *Secretary.*

June 19-21, 1918.—North Carolina Dental Society, Oceanic Hotel, Wilmington, N. C.—W. T. MARTIN, *Secretary,* Benson, N. C.

June 24, 1918.—The annual meeting of the Board of Dental Examiners in the State of South Carolina will be held at The Jefferson, Columbia, S. C., beginning promptly at 9 o'clock Monday morning. All applications must be in the hands of the Secretary by June 14th. Application blanks and full information may be obtained by addressing R. L. SPENCER, Bennettsville, S. C., *Secretary.*

June 25, 26, and 27, 1918.—The annual examination of candidates for West Virginia State License to practice, will be held at Parkersburg, W. Va., Blanks and information will be furnished on application to H. H. SMALLRIDGE, Charleston, W. Va., *Secretary.*

June 26-27, 1918.—The Annual Meeting of the North Eastern Mass. Dental Society will be held at the New Ocean House, Swampscott, Mass., Wednesday and Thursday. Finest Hotel on the North Shore. All members of the profession are cordially invited. Hotel rates one-half. $5.00 per day.

June 27-28-29, 1918.—The annual meeting of the South Carolina State Dental Association will be held at the Jefferson Hotel, Columbia, S. C.—ERNEST C. DYE, *Secretary*.

July, 1918.—New Jersey State Dental Society, Atlantic City, N. J.

July, 1918.—Wisconsin State Dental Society, Milwaukee.

July 1, 1918.—The next meeting of the South Dakota State Board of Dental Examiners will be held at Sioux Falls, S. D., beginning promptly at 9 o'clock Monday morning. All applications must be in the hands of the Secretary by June 24th. Fee for examination $25. No reciprocity or interchange. Full information and application blanks may be received by addressing L. S. SPENCER, Watertown, S. Dak., *Secretary*.

August 1–3, 1918.—The Eighteenth Annual Meeting of The American Society of Orthodontists will be held at the Edgewater Beach Hotel, Chicago, Ill. It is advisable to make your reservations early.

August 2–3, 1918.—The next Annual Meeting of the National Association of Dental Faculties will be held at Congress Hotel, Chicago, Ill.—CHARLES CHANNING ALLEN, N. W. Cor. 10th and Troost, Kansas City, Mo., *Secretary*.

Aug. 5–9, 1918.—The 1918 meeting of the National Dental Association will be held in Chicago during the first week of August. The House of Delegates and the Board of Trustees will meet Monday August 5th, and the meeting proper will begin Tuesday morning and close Friday noon. All sessions, clinics and exhibits will be held at the Auditorium and Congress Hotels, Michigan Avenue and Congress Sts. During the meeting a monument to the late Dr. G. V. Black will be unveiled.

THE FORSYTH DENTAL INFIRMARY FOR CHILDREN, BOSTON.

A competitive examination of graduates in dentistry (of less than three years standing) for appointments to positions on the Permanent Staff for full and one-half time service will be held early in June at the Infirmary.

Appointments will be made for one or two years as follows:

Full time service requiring operating five and one-half days a week at a salary of $1,000 a year.

One-half time service requiring operating six half-days a week, either forenoon or afternoon, at a salary of $400 a year.

These appointments will be made subject to satisfying the requirements of the Massachusetts State Board of Registration in Dentistry and to "qualifying" in the practical work of the clinics during one month's trial.

Operators after serving four months are eligible, by qualifying, for appointment in the special clinics where Post Graduate work is given.

The operators on this staff have the advantage of the clinics and lectures of the Post Graduate School of Orthodontia.

The Infirmary clinics provide unusual advantages in the various departments of the institution where Operative Dentistry, Orthodontia, Nose and Throat and Oral Surgery, Extracting, Novocaine Technic, Radiography, Pathological Diagnosis and Research Work are continually carried on.

The average number of cases treated daily is more than 450 in all departments.

All material and necessary operating instruments will be furnished; up-to-date apparatus including electric engines, sterile instrument trays, fountain cuspidors, compressed air, and the modern operating-room-type of lavatories are available for use.

A diploma for service will be issued by the Trustees to each member of this staff who has completed this term of service in a satisfactory manner.

Information and the date of the examination will be furnished to those interested. —HAROLD DEW. CROSS, D.M.D., *Director*, 140 The Fenway, Boston, Mass.